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NEWS 1		Web Page for STN Seminar Schedule - N. America
NEWS 2	JUL 28	CA/CAplus patent coverage enhanced
NEWS 3	JUL 28	EPFULL enhanced with additional legal status information from the epoline Register
NEWS 4	JUL 28	IFICDB, IFIPAT, and IFIUDB reloaded with enhancements
NEWS 5	JUL 28	STN Viewer performance improved
NEWS 6	AUG 01	INPADOCDB and INPAFAMDB coverage enhanced
NEWS 7	AUG 13	CA/CAplus enhanced with printed Chemical Abstracts page images from 1967-1998
NEWS 8	AUG 15	CAOLD to be discontinued on December 31, 2008
NEWS 9	AUG 15	CAplus currency for Korean patents enhanced
NEWS 10	AUG 27	CAS definition of basic patents expanded to ensure comprehensive access to substance and sequence information
NEWS 11	SEP 18	Support for STN Express, Versions 6.01 and earlier, to be discontinued
NEWS 12	SEP 25	CA/CAplus current-awareness alert options enhanced to accommodate supplemental CAS indexing of exemplified prophetic substances
NEWS 13	SEP 26	WPIDS, WPINDEX, and WPIX coverage of Chinese and and Korean patents enhanced
NEWS 14	SEP 29	IFICLS enhanced with new super search field
NEWS 15	SEP 29	EMBASE and EMBAL enhanced with new search and display fields
NEWS 16	SEP 30	CAS patent coverage enhanced to include exemplified prophetic substances identified in new Japanese-language patents
NEWS 17	OCT 07	EPFULL enhanced with full implementation of EPC2000
NEWS 18	OCT 07	Multiple databases enhanced for more flexible patent number searching
NEWS 19	OCT 22	Current-awareness alert (SDI) setup and editing enhanced
NEWS 20	OCT 22	WPIDS, WPINDEX, and WPIX enhanced with Canadian PCT Applications
NEWS 21	OCT 24	CHEMLIST enhanced with intermediate list of pre-registered REACH substances

NEWS EXPRESS JUNE 27 08 CURRENT WINDOWS VERSION IS V8.3,
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FILE COVERS 1907 - 17 Nov 2008 VOL 149 ISS 21
FILE LAST UPDATED: 16 Nov 2008 (20081116/ED)

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=> e us20070152185/pn
E1   1   US20070152183/PN
E2   1   US20070152184/PN
E3   1 --> US20070152185/PN
E4   1   US20070152186/PN
E5   2   US20070152187/PN
E6   1   US20070152188/PN
E7   1   US20070152189/PN
E8   1   US20070152190/PN
E9   1   US20070152191/PN
E10   1   US20070152192/PN
E11   1   US20070152193/PN
E12   1   US20070152194/PN

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L1   1 US20070152185/PN

L1 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2005:673860 CAPLUS
DN 143:176223
ED Entered STN: 31 Jul 2005
TI Composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries
IN Gauthier, Gilles; Le Cras, Frederic; Lignier, Helene; Gabelle, Jean Louis
PA Commissariat a l'Energie Atomique, Fr.
SO Fr. Demande, 45 pp.
CODEN: FRXXBL
DT Patent
LA French
IC ICM H01M004-60
ICS H01M004-26
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2865576	A1	20050729	FR 2004-50156	20040128
	FR 2865576	B1	20060428		
	WO 2005076390	A2	20050818	WO 2005-FR50045	20050126
	WO 2005076390	A3	20051006		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	EP 1709702	A2	20061011	EP 2005-717687	20050126
	EP 1709702	B1	20071205		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
	JP 2007520038	T	20070719	JP 2006-550260	20050126
	AT 380399	T	20071215	AT 2005-717687	20050126
	ES 2299019	T3	20080516	ES 2005-717687	20050126
	US 20070152185	A1	20070705	US 2007-586601	20070104 <--
PRAI	FR 2004-50156	A	20040128		
	WO 2005-FR50045	W	20050126		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
FR 2865576	ICM	H01M004-60
	ICS	H01M004-26
	IPCI	H01M0004-36 [I,C]; H01M0004-26 [I,C]; H01M0004-60 [I,A]; H01M0004-26 [I,A]
	IPCR	H01M0004-36 [I,C]; H01M0004-60 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-26 [I,C]; H01M0004-26 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
WO 2005076390	IPCR	C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A];

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EP 1709702	IPCI	H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
JP 2007520038	IPCI	H01M0004-04 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [N,A]; H01M0010-36 [N,C*]
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	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
	FTERM	5H029/AJ03; 5H029/AJ12; 5H029/AJ14; 5H029/AK03; 5H029/AL06; 5H029/AL07; 5H029/AL08; 5H029/CJ02; 5H029/CJ08; 5H029/CJ28; 5H029/DJ08; 5H029/EJ04; 5H029/EJ11; 5H029/EJ12; 5H029/HJ01; 5H029/HJ02; 5H029/HJ05; 5H029/HJ07; 5H029/HJ14; 5H050/AA08; 5H050/AA15; 5H050/AA19; 5H050/BA16; 5H050/BA17; 5H050/CA07; 5H050/CA08; 5H050/CA09; 5H050/CB07; 5H050/CB08; 5H050/CB09; 5H050/DA09; 5H050/EA08; 5H050/EA22; 5H050/EA23; 5H050/GA02; 5H050/GA10; 5H050/GA27; 5H050/HA01; 5H050/HA02; 5H050/HA05; 5H050/HA07; 5H050/HA14; 5H050/HA20
AT 380399	IPCI	H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
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ES 2299019	IPCI	H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
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	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
US 20070152185	IPCI	H01B0001-06 [I,A]; H01B0001-18 [I,A]; H01B0001-14 [I,C*]
	NCL	252/182.100; 252/506.000; 252/507.000

AB Electrode-active materials, especially for alkali ion insertion (i.e., Na+ and Li+) for lithium batteries, contain, as an active component, a composition of general formula AaDdMmZsOoNnFf,, in which: (1) A is an alkali metal, (2) D is an alkaline earth metal or a Group IIIA element, with the exception of B, (3) M is a transition metal, (4) Z is a non-metal selected from S, Se, P, As, Si, Ge, Sn, and B, (5) O is oxygen, N is nitrogen, and F is fluorine, and (6) a, d, m, z, o, n, and f are ≥0. The compns., which also contain an electron conductor, such as carbon, are prepared by thermal decomposition of homogeneously mixed precursors, which are organic or organometallic derivs. (preferably at 200-600°). Preferred components include: (1) A = Li, Na, and K, (2) D is Mg, Al, and Ga, (3) M = Fe, Ni, Co, Mn, V, Mo, Nb, W, and Ti; preferred components are LiFePO4, LiFeBO3, or NaFeBO3.

ST electrode mixed oxide lithium rechargeable battery; iron lithium borate secondary battery electrode

IT Transition metal oxides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(alkaline earth oxides, electrode active materials; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Transition metal oxides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(alkali metal oxides, electrode active materials; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Battery electrodes
(composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(dicarboxylic, metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially
for rechargeable lithium batteries)

IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(hydroxy, metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially
for rechargeable lithium batteries)

IT Amino acids, processes
Polyoxyalkylenes, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(oxo, metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Alkali metal oxides
Alkaline earth oxides
Group IIIA element oxides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(transition metal oxides, electrode active materials; composite mixed

oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(elec. conductor; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT 15365-14-7, Iron lithium phosphate (FeLiPO4) 332079-85-3, Iron lithium borate (FeLiBO3) 861001-97-0
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electrode active materials; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT 50-21-5D, Lactic acid, metal salts and complexes 56-40-6D, Aminoacetic acid, metal salts and complexes 56-41-7D, Alanine, metal salts and complexes 56-84-8D, L-Aspartic acid, metal salts and complexes 56-86-0D, L-Glutamic acid, metal salts and complexes 56-87-1D, L-Lysine, metal salts and complexes 61-90-5D, L-Leucine, metal salts and complexes 70-26-8D, Ornithine, metal salts and complexes 74-79-3D, L-Arginine, metal salts and complexes 77-92-9D, Citric acid, metal salts and complexes 79-14-1D, Glycolic acid, metal salts and complexes 87-69-4D, Tartaric acid, metal salts and complexes 90-64-2D, Mandelic acid, metal salts and complexes 107-21-1D, Ethylene glycol, metal salts and complexes 110-15-6D, Succinic acid, metal salts and complexes 110-16-7D, Maleic acid, metal salts and complexes 110-17-8D, Fumaric acid, metal salts and complexes 110-94-1D, Glutaric acid, metal salts and complexes 111-46-6D, Diethylene glycol, metal salts and complexes 123-76-2D, Levulinic acid, metal salts and complexes 124-04-9D, Adipic acid, metal salts and complexes 127-17-3D, Pyruvic acid, metal salts and complexes 141-82-2D, Malonic acid, metal salts and complexes 144-62-7D, Oxalic acid, metal salts and complexes 298-12-4D, Glyoxylic acid, metal salts and complexes 498-23-7D, Citraconic acid, metal salts and complexes 499-12-7D, Aconitic acid, metal salts and complexes 6915-15-7D, Malic acid, metal salts and complexes 28854-76-4D, metal salts and complexes 35054-79-6D, Hydroxybutyric acid, metal salts and complexes 111937-70-3D, Hydroxyacrylic acid, metal salts and complexes 151677-68-8
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Commissariat Energie Atomique; CH 513769 A 1971 CAPLUS
(2) Darmes, D; WO 0208355 A 2002 CAPLUS
(3) Du, K; JOURNAL OF ALLOYS AND COMPOUNDS 2003, V352(1-2), P250 CAPLUS
(4) Hydro Quebec; CA 2270771 A 2000 CAPLUS
(5) L'Energie Atomique Et Institut Francais Du Petrole Des Carburants Et; BE 735476 A 1969 CAPLUS
(6) Pechini, M; US 3330697 A 1967
(7) Univ Texas; WO 9740541 A 1997 CAPLUS

=> s 15365-14-7 and 7440-44-0
REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

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L3      387474 L2


   REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
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L5        1288 L4


L6         462 L5 AND L3



=> s l6 and electrode#
        730889 ELECTRODE#
L7         155 L6 AND ELECTRODE#

=> s l6 and (electrode# or anode# or cathode#)
        730889 ELECTRODE#
        184108 ANODE#
        227805 CATHODE#
L8         432 L6 AND (ELECTRODE# OR ANODE# OR CATHODE#)

=> s 50-21-5 or 56-40-6 or 56-41-7 or 56-84-8 or 56-86-0 or 56-87-1 or 61-90-5 or
70-26-8 or 74-79-3 or 77-92-9 or 79-14-1 or 87-69-4 or 90-64-2 or 107-21-1 or
110-15-6 or 110-16-7 or 110-17-8
   REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
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L10      15717 L9


   REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
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SEARCH QUERY NOT FOUND FOR AUTOMATED SEARCH AND CROSSOVER FIELD CODE
COMMAND STACK INTERRUPTED.  ENTER "DISPLAY HISTORY"
TO SEE WHICH COMMANDS WERE EXECUTED.

Invalid automated search and crossover syntax.  The information
preceding the automated search and crossover field resulted in no
query being identified.  This is typically caused by the character
preceding the "/" for the automated search and crossover field code
representing a termination point, such as a left parenthesis "(".
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=> s 50-21-5 or 56-40-6 or 56-41-7 or 56-84-8 or 56-86-0 or 56-87-1
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Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L12      55791 L11

   REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
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L14      76293 L13

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Substance data SEARCH and crossover from CAS REGISTRY in progress...
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L16      46908 L15

   REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
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L18      47918 L17

   REG1stRY INITIATED
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L20 65792 L19

REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
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L22 62717 L21

L23 236074 L22 OR L20 OR L18 OR L16 OR L14 OR L12

=> s 61-90-5 or 70-26-8 or 74-79-3 or 77-92-9 or 79-14-1 or 87-69-4 or 90-64-2 or 107-21-1 or 110-15-6 or 110-16-7 or 110-17-8
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L25 15717 L24

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L27 16848 L26

REG1stRY INITIATED
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L29 31313 L28

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L31 54546 L30

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L33 4069 L32

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L35 24133 L34

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L37 10725 L36

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L39 73205 L38

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L41 51955 L40

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L43 8664 L42

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L45 40764 L44

L46 258073 L45 OR L43 OR L41 OR L39 OR L37 OR L35 OR L33 OR L31 OR L29 OR L27 OR L25

=> s 110-94-1 or 111-46-6 or 123-76-2 or 124-04-9 or 127-17-3 or 141-82-2 or 144-62-7 or 298-12-4 or 498-23-7 or 499-12-7

REG1stRY INITIATED
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L48 1047 L47

REG1stRY INITIATED
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L50 1043 L49

REG1stRY INITIATED
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L52 5548 L51

REG1stRY INITIATED
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L54 36542 L53

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L56 14876 L55

REG1stRY INITIATED
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L58 25465 L57

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L60 16236 L59

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L62 2735 L61

REG1stRY INITIATED
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L64 15270 L63

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Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L66 6189 L65

L67 108496 L66 OR L64 OR L62 OR L60 OR L58 OR L56 OR L54 OR L52 OR L50 OR L48

=> s 6915-15-7 or 28854-76-4 or 35054-79-6 or 111937-70-3 or 151677-68-8
REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L69 7 L68

REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L71 32 L70

REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L73 286 L72

REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

```
L75         74 L74


   REG1stRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.




L77      24029 L76


L78      24346 L77 OR L75 OR L73 OR L71 OR L69




=> d his

     (FILE 'HOME' ENTERED AT 14:46:54 ON 17 NOV 2008)

     FILE 'CAPLUS' ENTERED AT 14:47:20 ON 17 NOV 2008
                E US20070152185/PN
L1            1 S E3
                S 15365-14-7/REG# AND  7440-44-0/REG#

     FILE 'REGISTRY' ENTERED AT 14:48:47 ON 17 NOV 2008
L2            1 S 7440-44-0/RN

     FILE 'CAPLUS' ENTERED AT 14:48:47 ON 17 NOV 2008
L3       387474 S L2

     FILE 'REGISTRY' ENTERED AT 14:48:47 ON 17 NOV 2008
L4            1 S 15365-14-7/RN

     FILE 'CAPLUS' ENTERED AT 14:48:48 ON 17 NOV 2008
L5         1288 S L4
L6          462 S L5 AND L3
L7          155 S L6 AND ELECTRODE#
L8          432 S L6 AND (ELECTRODE# OR ANODE# OR CATHODE#)
                S 50-21-5/REG# OR  56-40-6/REG# OR  56-41-7/REG# OR  56-84-8/RE

     FILE 'REGISTRY' ENTERED AT 14:59:41 ON 17 NOV 2008
L9            1 S 110-17-8/RN

     FILE 'CAPLUS' ENTERED AT 14:59:41 ON 17 NOV 2008
L10       15717 S L9
                S 50-21-5/REG# OR  56-40-6/REG# OR  56-41-7/REG# OR  56-84-8/RE
```

FILE 'REGISTRY' ENTERED AT 15:00:36 ON 17 NOV 2008
L11 1 S 56-87-1/RN

FILE 'CAPLUS' ENTERED AT 15:00:37 ON 17 NOV 2008
L12 55791 S L11

FILE 'REGISTRY' ENTERED AT 15:00:37 ON 17 NOV 2008
L13 1 S 56-86-0/RN

FILE 'CAPLUS' ENTERED AT 15:00:37 ON 17 NOV 2008
L14 76293 S L13

FILE 'REGISTRY' ENTERED AT 15:00:38 ON 17 NOV 2008
L15 1 S 56-84-8/RN

FILE 'CAPLUS' ENTERED AT 15:00:38 ON 17 NOV 2008
L16 46908 S L15

FILE 'REGISTRY' ENTERED AT 15:00:39 ON 17 NOV 2008
L17 1 S 56-41-7/RN

FILE 'CAPLUS' ENTERED AT 15:00:39 ON 17 NOV 2008
L18 47918 S L17

FILE 'REGISTRY' ENTERED AT 15:00:40 ON 17 NOV 2008
L19 1 S 56-40-6/RN

FILE 'CAPLUS' ENTERED AT 15:00:40 ON 17 NOV 2008
L20 65792 S L19

FILE 'REGISTRY' ENTERED AT 15:00:40 ON 17 NOV 2008
L21 1 S 50-21-5/RN

FILE 'CAPLUS' ENTERED AT 15:00:41 ON 17 NOV 2008
L22 62717 S L21
L23 236074 S L22 OR L20 OR L18 OR L16 OR L14 OR L12
S 61-90-5/REG# OR 70-26-8/REG# OR 74-79-3/REG# OR 77-92-9/RE

FILE 'REGISTRY' ENTERED AT 15:01:17 ON 17 NOV 2008
L24 1 S 110-17-8/RN

FILE 'CAPLUS' ENTERED AT 15:01:17 ON 17 NOV 2008
L25 15717 S L24

FILE 'REGISTRY' ENTERED AT 15:01:17 ON 17 NOV 2008
L26 1 S 110-16-7/RN

FILE 'CAPLUS' ENTERED AT 15:01:17 ON 17 NOV 2008
L27 16848 S L26

FILE 'REGISTRY' ENTERED AT 15:01:18 ON 17 NOV 2008
L28 1 S 110-15-6/RN

FILE 'CAPLUS' ENTERED AT 15:01:18 ON 17 NOV 2008
L29 31313 S L28

FILE 'REGISTRY' ENTERED AT 15:01:19 ON 17 NOV 2008
L30 1 S 107-21-1/RN

FILE 'CAPLUS' ENTERED AT 15:01:19 ON 17 NOV 2008
L31 54546 S L30

```
     FILE 'REGISTRY' ENTERED AT 15:01:20 ON 17 NOV 2008
L32          1 S 90-64-2/RN

     FILE 'CAPLUS' ENTERED AT 15:01:20 ON 17 NOV 2008
L33       4069 S L32

     FILE 'REGISTRY' ENTERED AT 15:01:20 ON 17 NOV 2008
L34          1 S 87-69-4/RN

     FILE 'CAPLUS' ENTERED AT 15:01:21 ON 17 NOV 2008
L35      24133 S L34

     FILE 'REGISTRY' ENTERED AT 15:01:21 ON 17 NOV 2008
L36          1 S 79-14-1/RN

     FILE 'CAPLUS' ENTERED AT 15:01:21 ON 17 NOV 2008
L37      10725 S L36

     FILE 'REGISTRY' ENTERED AT 15:01:22 ON 17 NOV 2008
L38          1 S 77-92-9/RN

     FILE 'CAPLUS' ENTERED AT 15:01:22 ON 17 NOV 2008
L39      73205 S L38

     FILE 'REGISTRY' ENTERED AT 15:01:23 ON 17 NOV 2008
L40          1 S 74-79-3/RN

     FILE 'CAPLUS' ENTERED AT 15:01:23 ON 17 NOV 2008
L41      51955 S L40

     FILE 'REGISTRY' ENTERED AT 15:01:23 ON 17 NOV 2008
L42          1 S 70-26-8/RN

     FILE 'CAPLUS' ENTERED AT 15:01:23 ON 17 NOV 2008
L43       8664 S L42

     FILE 'REGISTRY' ENTERED AT 15:01:24 ON 17 NOV 2008
L44          1 S 61-90-5/RN

     FILE 'CAPLUS' ENTERED AT 15:01:24 ON 17 NOV 2008
L45      40764 S L44
L46     258073 S L45 OR L43 OR L41 OR L39 OR L37 OR L35 OR L33 OR L31 OR L29 O
               S 110-94-1/REG# OR  111-46-6/REG# OR  123-76-2/REG# OR  124-04-

     FILE 'REGISTRY' ENTERED AT 15:02:30 ON 17 NOV 2008
L47          1 S 499-12-7/RN

     FILE 'CAPLUS' ENTERED AT 15:02:30 ON 17 NOV 2008
L48       1047 S L47

     FILE 'REGISTRY' ENTERED AT 15:02:31 ON 17 NOV 2008
L49          1 S 498-23-7/RN

     FILE 'CAPLUS' ENTERED AT 15:02:31 ON 17 NOV 2008
L50       1043 S L49

     FILE 'REGISTRY' ENTERED AT 15:02:31 ON 17 NOV 2008
L51          1 S 298-12-4/RN

     FILE 'CAPLUS' ENTERED AT 15:02:32 ON 17 NOV 2008
L52       5548 S L51
```

```
     FILE 'REGISTRY' ENTERED AT 15:02:32 ON 17 NOV 2008
L53          1 S 144-62-7/RN

     FILE 'CAPLUS' ENTERED AT 15:02:32 ON 17 NOV 2008
L54      36542 S L53

     FILE 'REGISTRY' ENTERED AT 15:02:33 ON 17 NOV 2008
L55          1 S 141-82-2/RN

     FILE 'CAPLUS' ENTERED AT 15:02:33 ON 17 NOV 2008
L56      14876 S L55

     FILE 'REGISTRY' ENTERED AT 15:02:33 ON 17 NOV 2008
L57          1 S 127-17-3/RN

     FILE 'CAPLUS' ENTERED AT 15:02:34 ON 17 NOV 2008
L58      25465 S L57

     FILE 'REGISTRY' ENTERED AT 15:02:34 ON 17 NOV 2008
L59          1 S 124-04-9/RN

     FILE 'CAPLUS' ENTERED AT 15:02:34 ON 17 NOV 2008
L60      16236 S L59

     FILE 'REGISTRY' ENTERED AT 15:02:35 ON 17 NOV 2008
L61          1 S 123-76-2/RN

     FILE 'CAPLUS' ENTERED AT 15:02:35 ON 17 NOV 2008
L62       2735 S L61

     FILE 'REGISTRY' ENTERED AT 15:02:36 ON 17 NOV 2008
L63          1 S 111-46-6/RN

     FILE 'CAPLUS' ENTERED AT 15:02:36 ON 17 NOV 2008
L64      15270 S L63

     FILE 'REGISTRY' ENTERED AT 15:02:36 ON 17 NOV 2008
L65          1 S 110-94-1/RN

     FILE 'CAPLUS' ENTERED AT 15:02:36 ON 17 NOV 2008
L66       6189 S L65
L67     108496 S L66 OR L64 OR L62 OR L60 OR L58 OR L56 OR L54 OR L52 OR L50 O
               S 6915-15-7/REG# OR  28854-76-4/REG# OR  35054-79-6/REG# OR  11

     FILE 'REGISTRY' ENTERED AT 15:03:27 ON 17 NOV 2008
L68          1 S 151677-68-8/RN

     FILE 'CAPLUS' ENTERED AT 15:03:27 ON 17 NOV 2008
L69          7 S L68

     FILE 'REGISTRY' ENTERED AT 15:03:28 ON 17 NOV 2008
L70          1 S 111937-70-3/RN

     FILE 'CAPLUS' ENTERED AT 15:03:28 ON 17 NOV 2008
L71         32 S L70

     FILE 'REGISTRY' ENTERED AT 15:03:28 ON 17 NOV 2008
L72          1 S 35054-79-6/RN

     FILE 'CAPLUS' ENTERED AT 15:03:29 ON 17 NOV 2008
L73        286 S L72
```

```
     FILE 'REGISTRY' ENTERED AT 15:03:29 ON 17 NOV 2008
L74           1 S 28854-76-4/RN

     FILE 'CAPLUS' ENTERED AT 15:03:29 ON 17 NOV 2008
L75          74 S L74

     FILE 'REGISTRY' ENTERED AT 15:03:30 ON 17 NOV 2008
L76           1 S 6915-15-7/RN

     FILE 'CAPLUS' ENTERED AT 15:03:30 ON 17 NOV 2008
L77       24029 S L76
L78       24346 S L77 OR L75 OR L73 OR L71 OR L69

=> l6 and (l9-l78)
L6 IS NOT A RECOGNIZED COMMAND
The previous command name entered was not recognized by the system.
For a list of commands available to you in the current file, enter
"HELP COMMANDS" at an arrow prompt (=>).

=> s l10 or l23 or l46 or l67 or l78
L79      498661 L10 OR L23 OR L46 OR L67 OR L78

=> d his

     (FILE 'HOME' ENTERED AT 14:46:54 ON 17 NOV 2008)

     FILE 'CAPLUS' ENTERED AT 14:47:20 ON 17 NOV 2008
                E US20070152185/PN
L1              1 S E3
                S 15365-14-7/REG# AND  7440-44-0/REG#

     FILE 'REGISTRY' ENTERED AT 14:48:47 ON 17 NOV 2008
L2              1 S 7440-44-0/RN

     FILE 'CAPLUS' ENTERED AT 14:48:47 ON 17 NOV 2008
L3         387474 S L2

     FILE 'REGISTRY' ENTERED AT 14:48:47 ON 17 NOV 2008
L4              1 S 15365-14-7/RN

     FILE 'CAPLUS' ENTERED AT 14:48:48 ON 17 NOV 2008
L5           1288 S L4
L6            462 S L5 AND L3
L7            155 S L6 AND ELECTRODE#
L8            432 S L6 AND (ELECTRODE# OR ANODE# OR CATHODE#)
                S 50-21-5/REG# OR  56-40-6/REG# OR  56-41-7/REG# OR  56-84-8/RE

     FILE 'REGISTRY' ENTERED AT 14:59:41 ON 17 NOV 2008
L9              1 S 110-17-8/RN

     FILE 'CAPLUS' ENTERED AT 14:59:41 ON 17 NOV 2008
L10         15717 S L9
                S 50-21-5/REG# OR  56-40-6/REG# OR  56-41-7/REG# OR  56-84-8/RE

     FILE 'REGISTRY' ENTERED AT 15:00:36 ON 17 NOV 2008
L11             1 S 56-87-1/RN

     FILE 'CAPLUS' ENTERED AT 15:00:37 ON 17 NOV 2008
L12         55791 S L11

     FILE 'REGISTRY' ENTERED AT 15:00:37 ON 17 NOV 2008
L13             1 S 56-86-0/RN
```

```
     FILE 'CAPLUS' ENTERED AT 15:00:37 ON 17 NOV 2008
L14       76293 S L13

     FILE 'REGISTRY' ENTERED AT 15:00:38 ON 17 NOV 2008
L15           1 S 56-84-8/RN

     FILE 'CAPLUS' ENTERED AT 15:00:38 ON 17 NOV 2008
L16       46908 S L15

     FILE 'REGISTRY' ENTERED AT 15:00:39 ON 17 NOV 2008
L17           1 S 56-41-7/RN

     FILE 'CAPLUS' ENTERED AT 15:00:39 ON 17 NOV 2008
L18       47918 S L17

     FILE 'REGISTRY' ENTERED AT 15:00:40 ON 17 NOV 2008
L19           1 S 56-40-6/RN

     FILE 'CAPLUS' ENTERED AT 15:00:40 ON 17 NOV 2008
L20       65792 S L19

     FILE 'REGISTRY' ENTERED AT 15:00:40 ON 17 NOV 2008
L21           1 S 50-21-5/RN

     FILE 'CAPLUS' ENTERED AT 15:00:41 ON 17 NOV 2008
L22       62717 S L21
L23      236074 S L22 OR L20 OR L18 OR L16 OR L14 OR L12
                S 61-90-5/REG# OR  70-26-8/REG# OR  74-79-3/REG# OR  77-92-9/RE

     FILE 'REGISTRY' ENTERED AT 15:01:17 ON 17 NOV 2008
L24           1 S 110-17-8/RN

     FILE 'CAPLUS' ENTERED AT 15:01:17 ON 17 NOV 2008
L25       15717 S L24

     FILE 'REGISTRY' ENTERED AT 15:01:17 ON 17 NOV 2008
L26           1 S 110-16-7/RN

     FILE 'CAPLUS' ENTERED AT 15:01:17 ON 17 NOV 2008
L27       16848 S L26

     FILE 'REGISTRY' ENTERED AT 15:01:18 ON 17 NOV 2008
L28           1 S 110-15-6/RN

     FILE 'CAPLUS' ENTERED AT 15:01:18 ON 17 NOV 2008
L29       31313 S L28

     FILE 'REGISTRY' ENTERED AT 15:01:19 ON 17 NOV 2008
L30           1 S 107-21-1/RN

     FILE 'CAPLUS' ENTERED AT 15:01:19 ON 17 NOV 2008
L31       54546 S L30

     FILE 'REGISTRY' ENTERED AT 15:01:20 ON 17 NOV 2008
L32           1 S 90-64-2/RN

     FILE 'CAPLUS' ENTERED AT 15:01:20 ON 17 NOV 2008
L33        4069 S L32

     FILE 'REGISTRY' ENTERED AT 15:01:20 ON 17 NOV 2008
L34           1 S 87-69-4/RN
```

FILE 'CAPLUS' ENTERED AT 15:01:21 ON 17 NOV 2008
L35 24133 S L34

FILE 'REGISTRY' ENTERED AT 15:01:21 ON 17 NOV 2008
L36 1 S 79-14-1/RN

FILE 'CAPLUS' ENTERED AT 15:01:21 ON 17 NOV 2008
L37 10725 S L36

FILE 'REGISTRY' ENTERED AT 15:01:22 ON 17 NOV 2008
L38 1 S 77-92-9/RN

FILE 'CAPLUS' ENTERED AT 15:01:22 ON 17 NOV 2008
L39 73205 S L38

FILE 'REGISTRY' ENTERED AT 15:01:23 ON 17 NOV 2008
L40 1 S 74-79-3/RN

FILE 'CAPLUS' ENTERED AT 15:01:23 ON 17 NOV 2008
L41 51955 S L40

FILE 'REGISTRY' ENTERED AT 15:01:23 ON 17 NOV 2008
L42 1 S 70-26-8/RN

FILE 'CAPLUS' ENTERED AT 15:01:23 ON 17 NOV 2008
L43 8664 S L42

FILE 'REGISTRY' ENTERED AT 15:01:24 ON 17 NOV 2008
L44 1 S 61-90-5/RN

FILE 'CAPLUS' ENTERED AT 15:01:24 ON 17 NOV 2008
L45 40764 S L44
L46 258073 S L45 OR L43 OR L41 OR L39 OR L37 OR L35 OR L33 OR L31 OR L29 O
S 110-94-1/REG# OR 111-46-6/REG# OR 123-76-2/REG# OR 124-04-

FILE 'REGISTRY' ENTERED AT 15:02:30 ON 17 NOV 2008
L47 1 S 499-12-7/RN

FILE 'CAPLUS' ENTERED AT 15:02:30 ON 17 NOV 2008
L48 1047 S L47

FILE 'REGISTRY' ENTERED AT 15:02:31 ON 17 NOV 2008
L49 1 S 498-23-7/RN

FILE 'CAPLUS' ENTERED AT 15:02:31 ON 17 NOV 2008
L50 1043 S L49

FILE 'REGISTRY' ENTERED AT 15:02:31 ON 17 NOV 2008
L51 1 S 298-12-4/RN

FILE 'CAPLUS' ENTERED AT 15:02:32 ON 17 NOV 2008
L52 5548 S L51

FILE 'REGISTRY' ENTERED AT 15:02:32 ON 17 NOV 2008
L53 1 S 144-62-7/RN

FILE 'CAPLUS' ENTERED AT 15:02:32 ON 17 NOV 2008
L54 36542 S L53

FILE 'REGISTRY' ENTERED AT 15:02:33 ON 17 NOV 2008
L55 1 S 141-82-2/RN

```
     FILE 'CAPLUS' ENTERED AT 15:02:33 ON 17 NOV 2008
L56       14876 S L55

     FILE 'REGISTRY' ENTERED AT 15:02:33 ON 17 NOV 2008
L57           1 S 127-17-3/RN

     FILE 'CAPLUS' ENTERED AT 15:02:34 ON 17 NOV 2008
L58       25465 S L57

     FILE 'REGISTRY' ENTERED AT 15:02:34 ON 17 NOV 2008
L59           1 S 124-04-9/RN

     FILE 'CAPLUS' ENTERED AT 15:02:34 ON 17 NOV 2008
L60       16236 S L59

     FILE 'REGISTRY' ENTERED AT 15:02:35 ON 17 NOV 2008
L61           1 S 123-76-2/RN

     FILE 'CAPLUS' ENTERED AT 15:02:35 ON 17 NOV 2008
L62        2735 S L61

     FILE 'REGISTRY' ENTERED AT 15:02:36 ON 17 NOV 2008
L63           1 S 111-46-6/RN

     FILE 'CAPLUS' ENTERED AT 15:02:36 ON 17 NOV 2008
L64       15270 S L63

     FILE 'REGISTRY' ENTERED AT 15:02:36 ON 17 NOV 2008
L65           1 S 110-94-1/RN

     FILE 'CAPLUS' ENTERED AT 15:02:36 ON 17 NOV 2008
L66        6189 S L65
L67      108496 S L66 OR L64 OR L62 OR L60 OR L58 OR L56 OR L54 OR L52 OR L50 O
                S 6915-15-7/REG# OR  28854-76-4/REG# OR  35054-79-6/REG# OR  11

     FILE 'REGISTRY' ENTERED AT 15:03:27 ON 17 NOV 2008
L68           1 S 151677-68-8/RN

     FILE 'CAPLUS' ENTERED AT 15:03:27 ON 17 NOV 2008
L69           7 S L68

     FILE 'REGISTRY' ENTERED AT 15:03:28 ON 17 NOV 2008
L70           1 S 111937-70-3/RN

     FILE 'CAPLUS' ENTERED AT 15:03:28 ON 17 NOV 2008
L71          32 S L70

     FILE 'REGISTRY' ENTERED AT 15:03:28 ON 17 NOV 2008
L72           1 S 35054-79-6/RN

     FILE 'CAPLUS' ENTERED AT 15:03:29 ON 17 NOV 2008
L73         286 S L72

     FILE 'REGISTRY' ENTERED AT 15:03:29 ON 17 NOV 2008
L74           1 S 28854-76-4/RN

     FILE 'CAPLUS' ENTERED AT 15:03:29 ON 17 NOV 2008
L75          74 S L74

     FILE 'REGISTRY' ENTERED AT 15:03:30 ON 17 NOV 2008
L76           1 S 6915-15-7/RN
```

```
     FILE 'CAPLUS' ENTERED AT 15:03:30 ON 17 NOV 2008
L77       24029 S L76
L78       24346 S L77 OR L75 OR L73 OR L71 OR L69
L79      498661 S L10 OR L23 OR L46 OR L67 OR L78

=> s l6 and l79
L80          21 L6 AND L79

=> s l8 and l80
L81          21 L8 AND L80

=> d 1-21 all

L81  ANSWER 1 OF 21  CAPLUS  COPYRIGHT 2008 ACS on STN
AN   2008:1169373  CAPLUS
DN   149:474211
ED   Entered STN:  30 Sep 2008
TI   High-density olivine-type lithium ferrous phosphate as cathode
     material of lithium-ion battery and its preparation method
IN   Lu, Xiangyang; Zuo, Yicun
PA   Guangzhou Rongjie Material Science and Technology Co., Ltd., Peop. Rep.
     China
SO   Faming Zhuanli Shenqing Gongkai Shuomingshu, 8pp.
     CODEN: CNXXEV
DT   Patent
LA   Chinese
CC   49-5 (Industrial Inorganic Chemicals)
FAN.CNT 1
     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------   --------
PI   CN 101269808         A     20080924    CN 2008-10026597       20080305
PRAI CN 2008-10026597           20080305
CLASS
 PATENT NO.      CLASS  PATENT FAMILY CLASSIFICATION CODES
 --------------  -----  ----------------------------------------------
 CN 101269808    IPCI   C01B0025-45 [I,A]; C01B0025-00 [I,C*]; H01M0004-58
                        [N,A]
AB   The title lithium ferrous phosphate material has olivine structure, average
     grain size of 1-8 μm, apparent d. ≥ 0.5 g/cm3, tap d. of 1.0-1.4
     g/cm3, sp. surface area ≤ 25 m2/g, and initial specific discharge
     capacity (1C) ≥ 130 mAh/g.  The title method comprises dispersing
     Fe source, P source, Li source, doping element compound, and carbon source
     in dispersant, ball-milling for 1-12 h, drying under nonoxidative atmospheric
at
     250-550° for 2-20 h, grinding, heating under reductive atmospheric at
     15-40°/min, calcining at 500-900° for 3-15 h, and cooling at
     15-40°/min to <40°.  The mol. ratio of Fe source, P source,
     Li source and doping element is (0.7-1):1:(0.98-1.06):(0.02-0.3).  The
     product has small particle size, narrow particle size distribution, high
     purity, and good electrochem. performance.
ST   olivine lithium ferrous phosphate cathode lithium ion battery
     prepn
IT   Density
        (apparent and tap; high-d. olivine-type lithium ferrous phosphate as
        cathode material of lithium-ion battery and its preparation method)
IT   Ball milling
     Calcination
       Cathodes
     Crystal structure
     Electric properties
     Grinding (size reduction)
```

Particle size
Solid phase synthesis
(high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT Secondary batteries
(lithium; high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT Surface area
(specific; high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT 7439-96-5, Manganese, uses
RL: MOA (Modifier or additive use); USES (Uses)
(dopant; high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT 7440-44-0P, Carbon, preparation 15365-14-7P
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT 7439-95-4, Magnesium, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses
RL: MOA (Modifier or additive use); USES (Uses)
(high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT 64-17-5, Ethanol, uses 1333-74-0, Hydrogen, uses 7727-37-9, Nitrogen, uses 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

IT 50-99-7, Glucose, reactions 57-50-1, Sucrose, reactions 77-92-9, Citric acid, reactions 546-89-4, Lithium acetate 554-13-2, Lithium carbonate 598-62-9, Manganese carbonate 1309-42-8, Magnesium hydroxide 1313-27-5, Molybdenum trioxide, reactions 1317-34-6, Manganese sesquioxide 7447-41-8, Lithium chloride, reactions 7664-38-2, Phosphoric acid, reactions 7705-08-0, Ferric chloride, reactions 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0, Diammonium hydrogen phosphate 7790-69-4, Lithium nitrate 9003-05-8, Polyacrylamide 9003-07-0, Polypropylene 9004-53-9, Dextrin 9005-25-8, Starch, reactions 10045-86-0, Ferric phosphate 10138-04-2, Ammonium ferric sulfate 10377-60-3, Magnesium nitrate 10377-66-9, Manganous nitrate 10381-36-9, Nickelous phosphate 10421-48-4, Ferric nitrate 12057-24-8, Lithium oxide, reactions 14154-09-7, Manganese phosphate
RL: RCT (Reactant); RACT (Reactant or reagent)
(high-d. olivine-type lithium ferrous phosphate as cathode material of lithium-ion battery and its preparation method)

L81 ANSWER 2 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2008:669636 CAPLUS
DN 149:13781
ED Entered STN: 05 Jun 2008
TI Cathode active mass for secondary lithium batteries, and their manufacture, and the batteries
IN Oshita, Itaru; Kanzaki, Kazuo
PA Hitachi Maxell Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14pp.
CODEN: JKXXAF
DT Patent
LA Japanese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI JP 2008130526 A 20080605 JP 2006-317924 20061127
PRAI JP 2006-317924 20061127
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2008130526	IPCI	H01M0004-58 [I,A]; H01M0004-02 [I,A]; H01M0010-40 [I,A]; H01M0010-36 [I,C*]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]; H01M0004-02 [I,C]; H01M0004-02 [I,A]; H01M0010-36 [I,C]; H01M0010-40 [I,A]
	FTERM	5H029/AJ02; 5H029/AJ03; 5H029/AM12; 5H029/AM16; 5H029/CJ02; 5H029/CJ08; 5H029/CJ28; 5H029/DJ08; 5H029/DJ15; 5H029/DJ16; 5H029/EJ04; 5H029/HJ02; 5H029/HJ05; 5H029/HJ14; 5H050/AA02; 5H050/AA08; 5H050/BA17; 5H050/CA01; 5H050/DA02; 5H050/DA10; 5H050/EA01; 5H050/EA08; 5H050/EA09; 5H050/FA16; 5H050/FA17; 5H050/GA02; 5H050/GA10; 5H050/GA27; 5H050/HA02; 5H050/HA05; 5H050/HA14

AB The active mass have olivine-type lithium iron phosphate primary particles and carbon-containing secondary particles, and the secondary particles have approx. spindle-, rhombus- or oval shape. The active mass is manufactured by a process including steps of (1) mixing lithium iron phosphate feedstock, carbonaceous materials, and C2-4 compds. bearing 2-3 hydroxy groups, and (2) heat treatment of the mixts. by hydrothermal crystallization, glycothermal process, or combination of two processes. Secondary Li batteries employing the cathode active mass are capable of high-speed charging and discharging and show high discharge capacity.

ST battery cathode lithium iron phosphate composite carbon; hydrothermal crystn lithium iron phosphate composite battery cathode; glycothermal process lithium iron phosphate composite battery cathode

IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(acetylene black, ketjen black, composites with lithium iron phosphates, cathode active mass; manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

IT Nanotubes
(carbon, composites with lithium iron phosphates, cathode active mass; manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

IT Carbon fibers, uses
Fullerenes
RL: TEM (Technical or engineered material use); USES (Uses)
(composites with lithium iron phosphates, cathode active mass; manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

IT Secondary batteries
(lithium; manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

IT Battery cathodes
Hydrothermal crystallization
(manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

IT Crystallization
(thermal, solvothermal; manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(composites with lithium iron phosphates, cathode active mass; manufacture of lithium iron phosphate-carbon composite granules as

secondary Li battery cathodes)
IT 56-81-5, Glycerol, uses 57-55-6, Propylene glycol, uses 107-21-1, Ethylene glycol, uses 107-88-0, 1,3-Butanediol 110-63-4, 1,4-Butanediol, uses 504-63-2, 1,3-Propanediol 3068-00-6, 1,2,4-Butanetriol 4435-50-1, 1,2,3-Butanetriol
RL: NUU (Other use, unclassified); USES (Uses)
(granulating agents; in manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)
IT 1310-65-2, Lithium hydroxide 1310-66-3, Lithium hydroxide monohydrate 7664-38-2, Phosphoric acid, uses 7720-78-7 7758-94-3, Ferrous chloride 7782-63-0, Iron sulfate heptahydrate 10045-89-3 13463-43-9, Ferrous sulfate hydrate 23838-02-0, Ferrous chloride hydrate 62586-14-5, Ammonium iron sulfate hydrate
RL: TEM (Technical or engineered material use); USES (Uses)
(in manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)
IT 15365-14-7P, Iron lithium phosphate (LiFePO4)
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(olivine-type, composites with carbon, cathode active mass; manufacture of lithium iron phosphate-carbon composite granules as secondary Li battery cathodes)

L81 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2008:595199 CAPLUS
DN 149:13704
ED Entered STN: 19 May 2008
TI Production of LiFePO4/C cathode material for lithium-ion batteries
IN Liu, Xinbao; Jia, Xiaolin; Ma, Meipin; Liu, Yufei; Zhou, Yonggang; Wu, Jiangfeng
PA Zhengzhou Dlg Battery Co., Ltd., Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 16pp.
CODEN: CNXXEV
DT Patent
LA Chinese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI CN 101179124	A	20080514	CN 2007-10055033	20070824
PRAI CN 2007-10055033		20070824		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
CN 101179124	IPCI	H01M0004-04 [I,A]; H01M0004-58 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]

AB This method entails: (a) preparing a solution of a Li compound, Fe compound, P compound and reductant at a molar ratio of 1:(0.8-1.2):(0.8-1.2):(0.3-1.0), adding Fe compound and Li compound to reductant, then adding P compound, mixing evenly under stirring, and aging, (b) drying under nonoxidative atmospheric to obtain dry gel, and grinding to obtain precursor, and (c) adding C compound 1.5-11.5% to the precursor, grinding, adding to a crucible, and microwave heating under nonoxidative atmospheric to obtain the final product. The method uses Cr3+ and Co3+ to modify LiFePO4/C. The method has the advantages of a decreased treatment time, enhanced yield, reduced cost and energy consumption and simplified process. The cathode material has the advantages of enhanced conductivity of LiFePO4 and enhanced charge-discharge capacity and cycling ability.
ST iron lithium phosphate carbon cathode material lithium battery

IT Carbon black, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(in production of LiFePO4/C cathode material for lithium-ion batteries)
IT Secondary batteries
(lithium; production of LiFePO4/C cathode material for lithium-ion batteries)
IT Battery cathodes
(production of LiFePO4/C cathode material for lithium-ion batteries)
IT 5931-89-5, Cobalt acetate 10103-47-6, Chromium nitrate 10124-43-3, Cobalt sulfate 10141-05-6, Cobalt nitrate 12336-95-7, Basic chromium sulfate 14489-25-9, Chromium sulfate 17593-70-3, Chromium acetate
RL: MOA (Modifier or additive use); USES (Uses)
(in production of LiFePO4/C cathode material for lithium-ion batteries)
IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(in production of LiFePO4/C cathode material for lithium-ion batteries)
IT 50-99-7, Glucose, reactions 57-50-1, Sucrose, reactions 63-42-3, Lactose 69-79-4, Maltose 546-89-4, Lithium acetate 1310-65-2, Lithium hydroxide 7664-38-2, Phosphoric acid, reactions 7782-42-5, Graphite, reactions 7783-28-0, Diammonium hydrogen phosphate 7790-69-4, Lithium nitrate 10028-22-5, Ferric sulfate 10124-31-9, Ammonium phosphate 10377-52-3, Lithium phosphate 10421-48-4, Ferric nitrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(in production of LiFePO4/C cathode material for lithium-ion batteries)
IT 50-81-7, Ascorbic acid, reactions 79-14-1, Glycolic acid, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(in production of LiFePO4/C cathode material for lithium-ion batteries)
IT 7440-44-0P, Carbon, uses 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(production of LiFePO4/C cathode material for lithium-ion batteries)

L81 ANSWER 4 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:1309501 CAPLUS
DN 147:525392
ED Entered STN: 16 Nov 2007
TI Cathode material for rechargeable batteries
IN Yang, Chih-Wei; Liu, Wen-Ren
PA Aquire Energy Co. Ltd., Taiwan
SO Eur. Pat. Appl., 19pp.
CODEN: EPXXDW
DT Patent
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 8

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1855334	A2	20071114	EP 2007-251938	20070510
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, YU				

	AT 385999	T	20080315	AT 2005-256174	20051003
	CA 2588494	A1	20071111	CA 2007-2588494	20070510
	KR 2007109903	A	20071115	KR 2007-45322	20070510
	JP 2007305585	A	20071122	JP 2007-125731	20070510
	IN 2007KO00730	A	20071123	IN 2007-KO730	20070510
	CN 101304083	A	20081112	CN 2007-10103278	20070510
PRAI	CN 2006-10080365	A	20060511		
	EP 2005-256174	A	20051003		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1855334	IPCI	H01M0004-48 [I,A]; H01M0004-58 [I,A]; H01M0010-40 [I,A]; H01M0010-36 [I,C*]
	IPCR	H01M0004-48 [I,C]; H01M0004-48 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0010-36 [I,C]; H01M0010-40 [I,A]
AT 385999	IPCI	C01G0049-00 [I,C]; C01G0049-00 [I,A]; C01B0013-14 [I,C]; C01B0013-14 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]; C01D0001-00 [I,C]; C01D0001-02 [I,A]; H01M0004-48 [I,C]; H01M0004-48 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	C01G0049-00 [I,C]; C01G0049-00 [I,A]; C01B0013-14 [I,C]; C01B0013-14 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]; C01D0001-00 [I,C]; C01D0001-02 [I,A]; H01M0004-48 [I,C]; H01M0004-48 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	ECLA	C01B025/37; H01M004/58D; M01P; M01P; M01P; M01P; T01M; T01M
CA 2588494	IPCI	H01M0004-36 [I,A]; H01M0004-52 [I,A]; H01M0004-58 [I,A]; H01M0010-00 [I,A]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-36 [I,C]; H01M0004-36 [I,A]; H01M0004-52 [I,C]; H01M0004-52 [I,A]; H01M0010-00 [I,C]; H01M0010-00 [I,A]
KR 2007109903	IPCI	H01M0004-58 [I,A]; H01M0004-62 [I,A]; H01M0010-02 [I,A]
JP 2007305585	IPCI	H01M0004-58 [I,A]; H01M0004-36 [I,A]; H01M0004-62 [I,A]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-36 [I,C]; H01M0004-36 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]
	FTERM	5H050/AA02; 5H050/AA08; 5H050/AA12; 5H050/BA16; 5H050/CA01; 5H050/CB12; 5H050/DA10; 5H050/EA08; 5H050/EA12; 5H050/FA17; 5H050/FA18; 5H050/HA01; 5H050/HA02
IN 2007KO00730	IPCI	H01M0004-58 [ICM,7]; H01M0010-02 [ICS,7]
CN 101304083	IPCI	H01M0004-02 [I,A]; H01M0010-04 [I,A]

AB This cathode material consists of a compound with an olivine or NASICON structure and a conductive metal oxide. The rechargeable battery has an anode, an electrolyte and a cathode as described above.

ST cathode rechargeable battery

IT Battery cathodes
Secondary batteries
(cathode material for rechargeable batteries)

IT Oxides (inorganic), uses
Phosphates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode material for rechargeable batteries)

IT 1314-13-2P, Zinc oxide (ZnO), uses 1344-28-1P, Alumina, uses 1344-70-3P, Copper oxide 7631-86-9P, Silica, uses 11099-11-9P, Vanadium oxide 11104-61-3P, Cobalt oxide 11129-60-5P, Manganese oxide 13463-67-7P, Titanium oxide (TiO2), uses 15365-14-7P, Iron lithium phosphate (FeLiPO4) 37275-76-6P, Aluminum zinc oxide
RL: SPN (Synthetic preparation); TEM (Technical or engineered material

use); PREP (Preparation); USES (Uses)
(cathode material for rechargeable batteries)
IT 1307-96-6P, Cobaltous oxide, uses 1309-48-4P, Magnesium oxide (MgO), uses 1313-99-1P, Nickel oxide (NiO), uses 1317-38-0P, Cupric oxide, uses 1344-43-0P, Manganous oxide, uses
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(in cathode material for rechargeable batteries)
IT 1314-62-1, Vanadium oxide (V2O5), uses 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(in cathode material for rechargeable batteries)
IT 57-50-1, Sucrose, reactions 77-92-9, Citric acid, reactions 1310-65-2, Lithium hydroxide (Li(OH)) 3251-23-8 7439-89-6, Iron, reactions 7646-85-7, Zinc chloride (ZnCl2), reactions 7664-38-2, Phosphoric acid, reactions 10026-22-9, Cobalt nitrate (Co(NO3)2) hexahydrate 13478-00-7, Nickel nitrate (Ni(NO3)2) hexahydrate 17141-63-8, Manganese nitrate (Mn(NO3)2) hexahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(in preparation of cathode material for rechargeable batteries)

L81 ANSWER 5 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:1292448 CAPLUS
DN 148:148282
ED Entered STN: 14 Nov 2007
TI Effects of Reductive Conditions on the Microstructure and Electrochemical Properties of Sol-Gel Derived LiFePO4/C
AU Lin, Yan; Pan, Hongge; Gao, Mingxia; Liu, Yongfeng
CS Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China
SO Journal of the Electrochemical Society (2007), 154(12), A1124-A1128
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 72
AB A sol-gel method was used to prepare LiFePO4/C composites by using ferric iron as iron precursor. Effects of reductive conditions including the amts. of organic additive of citric acid and the H2 content in the sintering atmospheric of N2 on the microstructural characteristics and electrochem. properties of LiFePO4/C are studied. The LiFePO4/C sample prepared with citric acid and cations in a ratio of 1:2 under sintering atmospheric of 10% H2 + N2 shows a highest discharge capacity of 135 mAh/g at the rate of 0.1 C (1 C = 170 mA/g). A carbon content of .apprx.4% provides a satisfactory discharge capacity of LiFePO4. Citric acid can act as a reducing reagent; hydrogen at 10-20 volume% in the sintering atmospheric can also reduce Fe3+ to Fe2+ completely and a further suitable amount of electro-conductive Fe2P phase could possibly form. Iron phosphides play an important role in the improvement of the high rate capacity of LiFePO4/C and the reaction kinetics of lithium ion. At discharge rates >1 C, suitably increasing the amount of Fe2P to a range of 6-11% in the LiFePO4/C composite favors the rate performance of LiFePO4/C.
ST reductive atm microstructure electrochem behavior iron lithium phosphate; secondary lithium battery cathode iron lithium phosphate discharge capacity
IT Reduction
(after sintering; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)
IT Electric capacitance
(discharge capacity; effects of reductive conditions on microstructure

and electrochem. properties of Sol-gel derived LiFePO4/C)

IT Controlled atmospheres
(during sintering; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT Battery cathodes
Composites
Cyclic voltammetry
Ionic conductivity
Sintering
Sol-gel processing
(effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT Carbon black, uses
Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT Secondary batteries
(lithium; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT Microstructure
(of cathode material; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT Electric current-potential relationship
(of cathodes during cyclic voltammetry; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 7440-44-0, Super P, uses
RL: ANT (Analyte); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)
(activated; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 1309-37-1, Iron oxide (Fe2O3), analysis 36058-25-0, Iron lithium phosphate (Fe2Li3PO4)3
RL: ANT (Analyte); FMU (Formation, unclassified); ANST (Analytical study); FORM (Formation, nonpreparative)
(after sintering; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: ANT (Analyte); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); ANST (Analytical study); PREP (Preparation); USES (Uses)
(effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 77-92-9, Citric acid, reactions 1333-74-0, Hydrogen, reactions 7722-76-1, Ammonium dihydrogen phosphate 7790-69-4, Lithium nitrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 21324-40-3, Lithium hexafluorophosphate 24937-79-9, PVDF
RL: TEM (Technical or engineered material use); USES (Uses)
(effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 1310-43-6, Iron phosphide (Fe2P) 26508-33-8, Iron phosphide (FeP)
RL: ANT (Analyte); FMU (Formation, unclassified); ANST (Analytical study); FORM (Formation, nonpreparative)
(formed in cathode; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)

IT 10377-52-3, Lithium phosphate (Li3PO4)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(formed in cathode; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)
IT 10421-48-4, Ferric nitrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(precursor; effects of reductive conditions on microstructure and electrochem. properties of Sol-gel derived LiFePO4/C)
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
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(17) Yang, J; J Electrochem Soc 2006, V153, PA716 CAPLUS

L81 ANSWER 6 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:1237548 CAPLUS
DN 147:505381
ED Entered STN: 01 Nov 2007
TI Cathode material for manufacturing a rechargeable battery
IN Yang, Chih-Wei
PA Aquire Energy Co. Ltd., Taiwan
SO Eur. Pat. Appl., 21pp.
CODEN: EPXXDW
DT Patent
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1850409	A1	20071031	EP 2007-251680	20070423
	R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, YU				
	CN 101064367	A	20071031	CN 2006-10074964	20060425
	CA 2585594	A1	20071025	CA 2007-2585594	20070420
	KR 2007105266	A	20071030	KR 2007-39924	20070424
	KR 809570	B1	20080304		
	JP 2007294461	A	20071108	JP 2007-114024	20070424
	IN 2007KO00638	A	20080725	IN 2007-KO638	20070425
PRAI	CN 2006-10074964	A	20060425		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1850409	IPCI	H01M0004-58 [I,A]; H01M0010-40 [I,A]; H01M0010-36 [I,C*]

CN 101064367 IPCI H01M0004-02 [I,A]; H01M0004-48 [I,A]; H01M0004-58 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]; H01M0010-40 [I,A]; H01M0010-36 [I,C*]
IPCR H01M0004-02 [I,C]; H01M0004-02 [I,A]
CA 2585594 IPCI H01M0004-58 [I,A]; H01M0010-02 [I,A]
IPCR H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0010-02 [I,C]; H01M0010-02 [I,A]
KR 2007105266 IPCI H01M0004-58 [I,A]; H01M0004-38 [I,A]
JP 2007294461 IPCI H01M0004-58 [I,A]; H01M0004-36 [I,A]; H01M0004-02 [I,A]; H01M0004-62 [I,A]
IPCR H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-02 [I,C]; H01M0004-02 [I,A]; H01M0004-36 [I,C]; H01M0004-36 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]
FTERM 5H050/AA02; 5H050/AA08; 5H050/BA17; 5H050/CA01; 5H050/CB07; 5H050/DA10; 5H050/DA11; 5H050/DA14; 5H050/EA08; 5H050/EA23; 5H050/EA24; 5H050/FA17; 5H050/FA18; 5H050/HA02; 5H050/HA05; 5H050/HA07
IN 2007KO00638 IPCI H01M0006-12 [ICM,7]; H01M0006-04 [ICM,7,C*]; H01M0006-46 [ICS,7]; H01M0006-42 [ICS,7,C*]

AB A cathode material includes crystalline nanometer-sized primary particles of a metal compound having one of olivine and NASICON structures and a particle size ranging from 10 to 500 nm, and micrometer-sized secondary particles having a particle size ranging from 1 to 50 μm. Each of the micrometer-sized secondary particles is composed of the crystalline nanometer-sized primary particles.

ST cathode material rechargeable battery fabrication

IT Battery cathodes
Nanoparticles
Particle size
Secondary batteries
Surface area
(cathode material for manufacturing rechargeable battery)

IT Carbonaceous materials (technological products)
Fluoropolymers, uses
Styrene-butadiene rubber, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cathode material for manufacturing rechargeable battery)

IT 50-99-7, Glucose, uses 57-50-1, Sucrose, uses 872-50-4, N-Methylpyrrolidone, uses 7446-70-0, Aluminum chloride (AlCl3), uses 7786-30-3, Magnesium chloride (MgCl2), uses 9000-11-7, CMC 24937-79-9, PVDF
RL: MOA (Modifier or additive use); USES (Uses)
(cathode material for manufacturing rechargeable battery)

IT 77-92-9, Citric acid, reactions 144-62-7, Oxalic acid, reactions 7439-89-6, Iron, reactions 7705-08-0, Ferric chloride, reactions 10421-48-4, Ferric nitrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(cathode material for manufacturing rechargeable battery)

IT 15365-14-7P, Iron lithium phosphate felipo4 928163-03-5P
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(cathode material for manufacturing rechargeable battery)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(particles; cathode material for manufacturing rechargeable battery)

IT 9003-55-8
RL: MOA (Modifier or additive use); USES (Uses)
(styrene-butadiene rubber; cathode material for manufacturing rechargeable battery)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

(1) Aquire Energy Co Ltd; EP 1790617 A 2007 CAPLUS
(2) Sony Corp; EP 1094533 A 2001 CAPLUS
(3) Sony Corp; EP 1193783 A 2002 CAPLUS

L81 ANSWER 7 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:971184 CAPLUS
DN 147:280968
ED Entered STN: 31 Aug 2007
TI Manufacture of iron lithium phosphate electrode materials and secondary lithium batteries using them
IN Inamasu, Tokuo; Fujii, Akihiro; Nukuta, Toshiyuki
PA Gs Yuasa Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 8pp.
CODEN: JKXXAF
DT Patent
LA Japanese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2007220390	A	20070830	JP 2006-37533	20060215
PRAI JP 2006-37533		20060215		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2007220390	IPCI	H01M0004-58 [I,A]; H01M0010-40 [N,A]; H01M0010-36 [N,C*]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0010-36 [N,C]; H01M0010-40 [N,A]
	FTERM	5H029/AJ02; 5H029/AJ03; 5H029/AK03; 5H029/AL12; 5H029/AM03; 5H029/AM05; 5H029/AM07; 5H029/BJ12; 5H029/CJ02; 5H029/CJ08; 5H029/CJ28; 5H029/DJ16; 5H029/EJ01; 5H029/EJ04; 5H029/EJ12; 5H029/EJ14; 5H029/HJ14; 5H050/AA02; 5H050/AA08; 5H050/BA17; 5H050/CA07; 5H050/CA08; 5H050/CB12; 5H050/EA02; 5H050/EA08; 5H050/EA09; 5H050/EA10; 5H050/EA23; 5H050/EA24; 5H050/FA17; 5H050/GA02; 5H050/GA10; 5H050/GA27; 5H050/HA14; 5H050/HA20

AB The materials are manufactured by treatment of aqueous solns. containing Fe compds. and conductive materials (e.g. carbon powder) with oxalic acid, and firing of the resulting Fe(II) oxalate with Li compds. and phosphoric acids. The materials and batteries show high utilization efficiency of iron lithium phosphate.

ST iron lithium phosphate lithium battery cathode; lithium battery cathode iron oxalate firing; battery cathode iron lithium phosphate carbon

IT Secondary batteries
(lithium; manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

IT Battery cathodes
(manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

IT 516-03-0P, Iron (II) oxalate
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical

process); PREP (Preparation); PROC (Process)
(manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

IT 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

IT 144-62-7, Oxalic acid, processes 554-13-2, Lithium carbonate 7720-78-7, Iron(II) sulfate 7722-76-1, Ammonium dihydrogen phosphate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of LiFePO4 cathodes containing carbon conductive materials for secondary lithium batteries from Fe compds. via Fe oxalate)

L81 ANSWER 8 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:470396 CAPLUS
DN 148:154036
ED Entered STN: 30 Apr 2007
TI Improvement of the electrochemical performance of LiFePO4 cathode composite material using a in situ pyrolysis carbon synthesis procedure
AU Luo, Shaohua; Tang, Zilong; Lu, Junbiao; Li, Junrong; Zhang, Zhongtai
CS State Key Laboratory of New Ceramics and Fine Processing, Department of Materials Science and Engineering, Tsinghua University, Beijing, 100084, Peop. Rep. China
SO Key Engineering Materials (2007), 336-338(Pt. 1, High-Performance Ceramics IV), 466-469
CODEN: KEMAEY; ISSN: 1013-9826
PB Trans Tech Publications Ltd.
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 52
AB LiFePO4/C composite cathode material was prepared by pelleting and subsequent pyrolytic cracking process in N2 atmosphere with C source of polyvinyl alc. (PVA). XRD crystal anal. indicates that single LiFePO4 phase and amorphous C can be found in the products. SEM observation shows a special micro-morphol. of sample, which is favorable for enhancement of electrochem. properties. The discharge capacity of the LiFePO4/C composite was 135 mAh/g, close to the charge capacity of 153 mAh/g at low rate of 0.1 C. At 0.2 C, the specific capacity was .apprx.117.4 mAh/g, which is satisfied for power source of Elec. Vehicle for its flat discharge platform.
ST electrochemi iron lithium phosphate cathode composite pyrolysis carbon synthesis
IT Battery cathodes
Cathodes
Cyclic voltammetry
Surface structure
X-ray diffraction
(improvement of electrochem. performance of LiFePO4 cathode composite material using a in situ pyrolysis carbon synthesis procedure)

IT 21324-40-3, Lithium hexafluorophosphate
RL: NUU (Other use, unclassified); USES (Uses)

(electrolyte; improvement of electrochem. performance of LiFePO4 cathode composite material using a in situ pyrolysis carbon synthesis procedure)

IT 7440-44-0P, Carbon, uses 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: OCU (Occurrence, unclassified); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); OCCU (Occurrence); PREP (Preparation); USES (Uses)
(improvement of electrochem. performance of LiFePO4 cathode composite material using a in situ pyrolysis carbon synthesis procedure)

IT 516-03-0, Iron oxalate 554-13-2, Lithium carbonate 7722-76-1, Ammonium dihydrogen phosphate 9002-89-5, Polyvinyl alcohol
RL: RCT (Reactant); RACT (Reactant or reagent)
(improvement of electrochem. performance of LiFePO4 cathode composite material using a in situ pyrolysis carbon synthesis procedure)

IT 107-21-1, Ethylene glycol, uses 616-38-6, Dimethyl carbonate
RL: NUU (Other use, unclassified); USES (Uses)
(solvent containing; improvement of electrochem. performance of LiFePO4 cathode composite material using a in situ pyrolysis carbon synthesis procedure)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Chen, Z; J Electrochem Soc 2002, V149, PA1184 CAPLUS
(2) Huang, H; Electrochem Solid-State Lett 2001, V4, PA170 CAPLUS
(3) Lu, J; Acta Phys-Chim Sin 2001, V21(3), P319
(4) Lu, J; Rare Metal Mat Eng 2001, V33(7), P679
(5) Padhi, A; J Electrochem Soc 1997, V144, P1188 CAPLUS
(6) Prosini, P; Electrochim Acta 2001, V46, P3517 CAPLUS
(7) Yamada, A; J Electrochem Soc 2001, V148, PA224 CAPLUS

L81 ANSWER 9 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN

AN 2007:286942 CAPLUS

DN 146:299360

ED Entered STN: 16 Mar 2007

TI Cathode material for manufacturing a rechargeable battery

IN Yang, Chih-Wei

PA Aquire Energy Co., Ltd., Taiwan

SO U.S. Pat. Appl. Publ., 17pp., Cont.-in-part of U.S. Ser. No. 222,569.
CODEN: USXXCO

DT Patent

LA English

INCL 429209000; 423306000; 429217000; 252182100; 429232000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

FAN.CNT 8

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20070059598	A1	20070315	US 2006-510096	20060825
	US 20060257307	A1	20061116	US 2005-222569	20050909
	AT 385999	T	20080315	AT 2005-256174	20051003
	US 20070207385	A1	20070906	US 2007-747746	20070511
	US 20070238021	A1	20071011	US 2007-764686	20070618
	US 20080107967	A1	20080508	US 2007-940283	20071114
	US 20080138710	A1	20080612	US 2007-940276	20071114
PRAI	US 2005-222569	A2	20050909		
	TW 2005-94115023	A	20050510		
	EP 2005-256174	A	20051003		
	CN 2006-10080365	A	20060511		
	US 2006-510096	A2	20060825		
	US 2006-518805	A2	20060911		

US 2007-747746 A2 20070511
US 2007-764629 A2 20070618

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 20070059598	INCL	429209000; 423306000; 429217000; 252182100; 429232000
	IPCI	C01B0025-26 [I,A]; C01B0025-00 [I,C*]; H01M0004-02 [I,A]; H01M0004-62 [I,A]
	IPCR	C01B0025-00 [I,C]; C01B0025-26 [I,A]; H01M0004-02 [I,C]; H01M0004-02 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]
	NCL	429/209.000; 252/182.100; 423/306.000; 429/217.000; 429/232.000
	ECLA	H01M004/58D; H01M004/136; T01M; T01M; T01M
US 20060257307	IPCI	C01B0025-26 [I,A]; C01B0025-00 [I,C*]
	IPCR	C01B0025-00 [I,C]; C01B0025-26 [I,A]
	NCL	423/306.000
	ECLA	H01M004/58D; C01B025/45; C01D015/02; H01M004/131; H01M004/136; H01M004/485; H01M004/62; H01M004/62B; H01M004/62C2; M01P; T01M; T01M; T01M; T01M; T01M; Y01N
AT 385999	IPCI	C01G0049-00 [I,C]; C01G0049-00 [I,A]; C01B0013-14 [I,C]; C01B0013-14 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]; C01D0001-00 [I,C]; C01D0001-02 [I,A]; H01M0004-48 [I,C]; H01M0004-48 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	C01G0049-00 [I,C]; C01G0049-00 [I,A]; C01B0013-14 [I,C]; C01B0013-14 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]; C01D0001-00 [I,C]; C01D0001-02 [I,A]; H01M0004-48 [I,C]; H01M0004-48 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	ECLA	C01B025/37; H01M004/58D; M01P; M01P; M01P; M01P; T01M; T01M
US 20070207385	IPCI	H01M0004-58 [I,A]; H01M0004-62 [I,A]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]
	NCL	429/231.900; 252/182.100; 429/231.600; 429/231.950; 429/232.000
	ECLA	H01M004/58D; H01M004/131; H01M004/136; H01M004/485; H01M004/62; H01M004/62B; H01M004/62C2; T01M; T01M; T01M; T01M; T01M
US 20070238021	IPCI	H01M0004-38 [I,A]
	IPCR	H01M0004-38 [I,C]; H01M0004-38 [I,A]
	NCL	429/218.100
	ECLA	H01M004/58D; H01M004/485; H01M004/58; H01M004/62C2; T01M; T01M; T01M
US 20080107967	IPCI	H01M0004-38 [I,A]; H01M0004-48 [I,A]
	NCL	429/219.000; 429/229.000; 429/231.600; 429/218.100; 429/231.800; 429/231.900; 429/231.950; 429/231.500; 429/223.000; 429/222.000
US 20080138710	IPCI	H01M0004-36 [I,A]; H01M0004-42 [I,A]; H01M0004-44 [I,A]; H01M0004-46 [I,A]
	NCL	429/222.000; 429/229.000; 429/231.000; 429/231.600; 252/182.330

AB A cathode material having olivine or NASICON structures and includes micrometer-sized secondary particles having a particle size of 1-50 μm. Each of the micrometer-sized secondary particles is composed of crystalline nanometer-sized primary particles of a metal compound having a particle size of 10-500 nm. The metal compound has a formula A3xM2y(PO4)3 with A being a Group IA, IIA, or IIIA element, M being a 2nd metal element from Groups IIA, IIIA, or a transition element, and $0<x\leq1.2$, and $0<y\leq1.6$. Carbon particles adhere to the surface of the crystalline nanometer-sized primary particles. The cathode material has a

BET sp. surface area of 5-100 m2/g. The cathode material is coated on an electrode plate. The cathode material contains a binder, such as styrene-butadiene rubber or polyvinylidene fluoride. The cathode material contains a thickener, especially CM-cellulose.

ST cathode material rechargeable battery lithium ferrous phosphate

IT Styrene-butadiene rubber, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cathode containing; cathode material for manufacturing rechargeable battery)

IT Battery cathodes
NASICONs
Secondary batteries
(cathode material for manufacturing rechargeable battery)

IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(cathode material for manufacturing rechargeable battery)

IT Charcoal
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(cathode material for manufacturing rechargeable battery)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(anode, cathode containing; cathode material for manufacturing rechargeable battery)

IT 9004-32-4, Carboxymethyl cellulose
RL: MOA (Modifier or additive use); USES (Uses)
(cathode containing; cathode material for manufacturing rechargeable battery)

IT 24937-79-9, Polyvinylidene fluoride
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(cathode containing; cathode material for manufacturing rechargeable battery)

IT 50-99-7, Glucose, processes 57-50-1, Sucrose, processes 77-92-9, Citric acid, processes 144-62-7, Oxalic acid, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(cathode material for manufacturing rechargeable battery)

IT 1310-65-2, Lithium hydroxide 7439-89-6, Iron, reactions 7446-70-0, Aluminum chloride, reactions 7664-38-2, Phosphoric acid, reactions 7705-08-0, Ferric chloride, reactions 7786-30-3, Magnesium chloride, reactions 10421-48-4, Ferric nitrate
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(cathode material for manufacturing rechargeable battery)

IT 15365-14-7P, Iron lithium phosphate felipo4 928163-03-5P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(cathode material; cathode material for manufacturing rechargeable battery)

IT 7429-90-5, Aluminum, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(electrode plate; cathode material for manufacturing rechargeable battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte containing; cathode material for manufacturing rechargeable battery)

IT 21324-40-3, Lithium hexafluorophosphate
RL: TEM (Technical or engineered material use); USES (Uses)

(electrolyte; cathode material for manufacturing rechargeable battery)
IT 9003-55-8
RL: MOA (Modifier or additive use); USES (Uses)
(styrene-butadiene rubber, cathode containing; cathode material for manufacturing rechargeable battery)

L81 ANSWER 10 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:186394 CAPLUS
DN 146:255322
ED Entered STN: 20 Feb 2007
TI Method for microwave synthesis of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries
IN Zou, Zhigang; Zhu, Mei; Chen, Hong
PA Nanjing University, Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 9pp.
CODEN: CNXXEV
DT Patent
LA Chinese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI CN 1911792	A	20070214	CN 2006-10041396	20060822
PRAI CN 2006-10041396		20060822		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
CN 1911792	IPCI	C01B0025-45 [I,A]; C01B0025-00 [I,C*]; H01M0004-58 [I,A]
	IPCR	C01B0025-00 [I,C]; C01B0025-45 [I,A]

AB Carbon coated lithium iron phosphate is produced by ball milling a Li salt, a ferrous salt, a phosphate, and organic carbon source at a molar ratio of Li:Fe:P:C = 1:1:1:(0.2-2) in ethanol or acetone as a dispersant for 3-6 h, drying, tabletting, placing into alumina pot containing activated carbon, and heating under microwave irradiation for 5-12 min. The Li salt can be lithium carbonate, lithium hydroxide, lithium acetate, lithium lactate, lithium oxalate, lithium citrate, or lithium formate. The ferrous salt can be ferrous oxalate, ferrous acetate, or ferrous lactate. The phosphate can be diammonium hydrogen phosphate or ammonium dihydrogen phosphate. The organic carbon source can be citric acid, oxalic acid, tartaric acid, glucose, sucrose, lactose, or maltose. The composite material can be used to fabricate cathodes for lithium batteries.
ST carbon coated lithium iron phosphate composite cathode battery
IT Secondary batteries
(lithium; production of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries)
IT Ball milling
Battery cathodes
Microwave heating
(production of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries)
IT 64-17-5, Ethanol, uses 67-64-1, Acetone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(dispersant; production of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries)
IT 7440-44-0, Carbon, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(lithium iron phosphate coated with, cathode material; production of carbon coated lithium iron phosphate used as composite

cathode material of lithium batteries)

IT 15365-14-7P, Iron lithium phosphate FeLiPO4
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(production of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries)

IT 50-99-7, Glucose, processes 57-50-1, Sucrose, processes 63-42-3, Lactose 69-79-4, Maltose 77-92-9, Citric acid, processes 87-69-4, Tartaric acid, processes 144-62-7, Oxalic acid, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(production of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries)

IT 516-03-0, Ferrous oxalate 546-89-4, Lithium acetate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 556-63-8, Lithium formate 867-55-0, Lithium lactate 919-16-4, Lithium citrate 1310-65-2, Lithium hydroxide 3094-87-9, Ferrous acetate 5905-52-2, Ferrous lactate 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0, Diammonium hydrogen phosphate
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(production of carbon coated lithium iron phosphate used as composite cathode material of lithium batteries)

L81 ANSWER 11 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2007:152960 CAPLUS
DN 146:255292
ED Entered STN: 12 Feb 2007
TI Preparation of high density ultrafine composite lithium iron phosphate as cathode material for lithium ion batteries
IN Li, Jun; Lai, Guitang; Huang, Huimin; Xia, Xinde; Xue, Jianjun; Li, Daguang
PA Guangzhou Great Power Battery Co., Ltd., Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 11pp.
CODEN: CNXXEV
DT Patent
LA Chinese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1907844	A	20070207	CN 2006-10037041	20060811
PRAI	CN 2006-10037041		20060811		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
CN 1907844	IPCI	C01B0025-45 [I,A]; C01B0025-00 [I,C*]; H01M0004-58 [I,A]
	IPCR	C01B0025-00 [I,C]; C01B0025-45 [I,A]

AB The title process comprises: (1) mixing P compound, Li salt with Fe salt by a mol. ratio of 1-1.1:1-1.1:1-1.1 under the addition of compds. of doping elements or carbon organic compds. (conductive additive); (2) adding organic acid as support; (3) allowing reaction at ≤ 100 °C to obtain nanometer precursor under regulating pH to 4.0-9.0 with LiOH and ammonia liquor; and (4) calcining at 600-800 °C for 5-300 min to give the title product. The Li salt is LiOH, Li2CO3, lithium oxalate, lithium fluoride, lithium phosphate and/or lithium acetate. The Fe salt is soluble Fe salt, ferrous acetate and/or ferrous sulfate. The P compound is NH4H2PO4 and/or (NH4)2HPO4. The doping compound is magnesium acetate and/or magnesium hydroxide. The organic acid is oxalic acid, tartaric acid, acrylic

acid, citric acid, polyacrylic acid, humic acid, polyvinylpyrrolidone, 2-ethylhexoic acid, and/or succinic acid. The carbon-containing organic additive is polypropylene, polyacrylamide, glucose, sucrose, and/or starch. The title product has stable structure, good thermal stability, and good recycling properties.

ST high density ultrafine composite lithium iron phosphate anode battery

IT Secondary batteries
(lithium, lithium ion; preparation of high d. ultrafine composite lithium iron phosphate as anode material for lithium ion batteries)

IT Nanoparticles
Powders
(nanopowders; preparation of high d. ultrafine composite lithium iron phosphate as anode material for lithium ion batteries)

IT Carbon black, uses
Fluoropolymers, uses
Humic acids
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(preparation of high d. ultrafine composite lithium iron phosphate as anode material for lithium ion batteries)

IT 9003-07-0, Celgard2300
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(film; preparation of high d. ultrafine composite lithium iron phosphate as anode material for lithium ion batteries)

IT 50-99-7, Glucose, uses 57-50-1, Sucrose, uses 77-92-9, Citric acid, uses 79-10-7, Acrylic acid, uses 87-69-4, Tartaric acid, uses 96-49-1, Ethylene carbonate 110-15-6, Succinic acid, uses 142-72-3, Magnesium acetate 144-62-7, Oxalic acid, uses 149-57-5, 2-Ethylhexoic acid 546-89-4, Lithium acetate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 616-38-6, Dimethyl carbonate 1309-42-8, Magnesium hydroxide 1310-65-2, Lithium hydroxide 1345-25-1, Ferrous oxide, uses 3094-87-9, Ferrous acetate 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7664-41-7, Ammonia, uses 7720-78-7, Ferrous sulfate 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0, Diammonium hydrogen phosphate 7789-24-4, Lithium fluoride, uses 9003-01-4, Polyacrylic acid 9003-05-8, Polyacrylamide 9003-39-8, Polyvinylpyrrolidone 9005-25-8, Starch, uses 10377-52-3, Lithium phosphate 15365-14-7, Iron lithium phosphate FeLiPO4 21324-40-3, Lithium hexafluorophosphate 24937-79-9, Polyvinylidene fluoride
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(preparation of high d. ultrafine composite lithium iron phosphate as anode material for lithium ion batteries)

L81 ANSWER 12 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2006:1216545 CAPLUS
DN 147:238626
ED Entered STN: 20 Nov 2006
TI Mass and charge transport in hierarchically organized storage materials. Example: Porous active materials with nanocoated walls of pores
AU Gaberscek, Miran; Dominko, Robert; Bele, Marjan; Remskar, Maja; Jamnik, Janez
CS National Institute of Chemistry, Ljubljana, SI-1000, Slovenia
SO Solid State Ionics (2006), 177(35-36), 3015-3022
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier B.V.
DT Journal

LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
AB To enhance the kinetics of poorly conducting cathode materials for Li batteries, the authors have proposed a number of strategies based on crushing the active material into nanopowder and embedding the powder into a carbon-based web or coating. Using the well-elaborated example of LiFePO4, we demonstrate that the same goal can be achieved with a different approach where the active material remains in a form of large (1-20 μm) single crystals. Instead of crushing the material, we make it porous, with average pore size around 50 nm and pore surface area of 25 m2/g. The walls of the pores (but also the outer surfaces of crystals) are covered with ca. 1 nm thick carbon film. Most surprisingly, such a unique nanoarchitecture can be prepared using a simple sol-gel based procedure including a single heat treatment. The crucial part is the selection of appropriate carbon precursor. For example, citric acid decomps. quite vigorously into gases and solid carbon at temps. up to ca. 450 °C. This range matches exactly the first solidification of LiFePO4. Thus, the evolving gases can create an interconnected web of pores while the solid parts (carbon) are deposited simultaneously on the walls of pores. We further show that a carbon content of less than 3% is already sufficient for surpassing the percolation threshold with respect to surface conductivity of carbon. Using more carbon can decrease the rate performance so a fine balance is required in this respect. Most importantly, carbonization at a temperature of slightly less than 700 °C is sufficient to achieve a composite conductivity of the order of 10-2 S cm-2-more than sufficient for good cathode kinetics. In the end, we show new evidence that the phase that is responsible for high conductivity of LiFePO4-C composites is indeed the carbon phase.
ST lithium iron phosphate carbon composite lithium battery cathode; titania carbon composite lithium battery cathode
IT Secondary batteries
(lithium; mass and charge transport in porous active materials with nanocoated walls of pores, hierarchically organized storage materials)
IT Composites
Porous materials
(mass and charge transport in porous active materials with nanocoated walls of pores, hierarchically organized storage materials)
IT 13463-67-7, Titania, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(composite with C; mass and charge transport in porous active materials with nanocoated walls of pores, hierarchically organized storage materials)
IT 15365-14-7, Iron lithium phosphate felipo4
RL: TEM (Technical or engineered material use); USES (Uses)
(composite with C; mass and charge transport in porous active materials with nanocoated walls of pores, hierarchically organized storage materials)
IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(composite with FeLiPO4; mass and charge transport in porous active materials with nanocoated walls of pores, hierarchically organized storage materials)
IT 77-92-9, Citric acid, reactions 3522-50-7, Ferric citrate
7664-38-2, Phosphoric acid, reactions 10377-52-3, Lithium phosphate
13453-80-0, Lithium dihydrogen phosphate
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(mass and charge transport in porous active materials with nanocoated walls of pores, hierarchically organized storage materials)
RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 13 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2006:958597 CAPLUS
DN 146:503916
ED Entered STN: 18 Sep 2006
TI Synthesis and effect of forming Fe2P phase on the physics and electrochemical properties of LiFePO4/C materials
AU Xu, Yanbin; Lu, Yingjun; Yan, Lan; Yang, Zhengyin; Yang, Rudong
CS College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou, 730000, Peop. Rep. China
SO Journal of Power Sources (2006), 160(1), 570-576
CODEN: JPSODZ; ISSN: 0378-7753
PB Elsevier B.V.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
AB A series of LiFePO4/C materials were prepared by a reformative solid-coordination method which uses citric acid as the coordination agent and C source. A monodentate coordination bond of -COO-M forms gradually and that helps to disperse Li+ or Fe2+ in the homogeneous gel during grinding. Impure phase Fe2P was detected in the LiFePO4/C composites with increasing annealing temperature The remnant coating C was considered to be the reductive in pure N. The amts. of C, particle size and morphol. were studied in detail and all the results can be related to the formation of Fe2P. The electro-conductive Fe2P phase in LiFePO4/C composites has an important role in increasing electronic conductivity and it improves the electrochem. performance of LiFePO4/C including the polarization phenomenon, comparatively high reversible capability, stable cycling performance and slight trend of less loss of rate capability.
ST iron phosphide lithium iron phosphate carbon cathode lithium battery
IT Secondary batteries
(lithium; synthesis of LiFePO4/C cathode material for lithium batteries with forming of Fe2P phase and its effects)
IT Battery cathodes
(synthesis of LiFePO4/C cathode material for lithium batteries with forming of Fe2P phase and its effects)
IT 77-92-9, Citric acid, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)

(in synthesis of LiFePO4/C cathode material for lithium batteries with forming of Fe2P phase and its effects)
IT 1310-43-6, Iron phosphide (Fe2P)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(synthesis of LiFePO4/C cathode material for lithium batteries with forming of Fe2P phase and its effects)
IT 7440-44-0P, Carbon, uses 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(synthesis of LiFePO4/C cathode material for lithium batteries with forming of Fe2P phase and its effects)
RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L81 ANSWER 14 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2005:1339204 CAPLUS
DN 145:359878
ED Entered STN: 26 Dec 2005
TI Synthesis, characterization and properties of LiFePO4/C cathode material
AU Zhou, Xin-wen; Zhan, Dan; Wang, Li-na; Liu, Qiao-yun; Zong, Hong-xing; Zhang, Ke-li
CS College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, 430072, Peop. Rep. China
SO Wuhan University Journal of Natural Sciences (2005), 10(5), 909-912
CODEN: WUNSFW; ISSN: 1007-1202
PB Wuhan University Journals Press
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB Lithium iron phosphate coated with carbon (LiFePO4/C) was synthesized by a rheol. phase reaction using a comparatively lower temperature and less sintering time. The carbon came from citric acid, which acted as a new carbon

source. It was characterized by thermogravimetry and DTA (TG/DTA), X ray diffractometer (XRD), Element Anal. (EA) and Scanning electron microscope (SEM). We also studied the electrochem. properties of the material. The first discharge capacity of the LiFePO4/C is 121 mAh · g-1 at 10 mA · g-1 at room temperature When the c.d. increased to 100 mA · g-1 · the first discharge capacity decreased to 110 mAh · g-1 and retained 95% of the initial capacity after 100 cycles. The LiFePO4/C obtained shows a good electrochem. capacity and cycle ability at a large c.d.

ST lithium iron phosphate lithium ion battery cathode

IT Secondary batteries
(lithium, lithium ion; synthesis, characterization and properties of LiFePO4/C cathode material for lithium ion batteries)

IT Battery cathodes
Electrochemistry
Surface structure
(synthesis, characterization and properties of LiFePO4/C cathode material for lithium ion batteries)

IT 77-92-9, Citric acid, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbon source; synthesis, characterization and properties of LiFePO4/C cathode material for lithium ion batteries)

IT 7440-44-0P, Carbon, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(coated onto LiFePO4; synthesis, characterization and properties of LiFePO4/C cathode material for lithium ion batteries)

IT 15365-14-7P, Iron lithium phosphate felipo4
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(coated with carbon; synthesis, characterization and properties of LiFePO4/C cathode material for lithium ion batteries)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 15 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN

AN 2005:673860 CAPLUS

DN 143:176223

ED Entered STN: 31 Jul 2005

TI Composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries

IN Gauthier, Gilles; Le Cras, Frederic; Lignier, Helene; Gabelle, Jean Louis

PA Commissariat a l'Energie Atomique, Fr.

SO Fr. Demande, 45 pp.
CODEN: FRXXBL

DT Patent
LA French
IC ICM H01M004-60
ICS H01M004-26
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2865576	A1	20050729	FR 2004-50156	20040128
	FR 2865576	B1	20060428		
	WO 2005076390	A2	20050818	WO 2005-FR50045	20050126
	WO 2005076390	A3	20051006		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	EP 1709702	A2	20061011	EP 2005-717687	20050126
	EP 1709702	B1	20071205		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
	JP 2007520038	T	20070719	JP 2006-550260	20050126
	AT 380399	T	20071215	AT 2005-717687	20050126
	ES 2299019	T3	20080516	ES 2005-717687	20050126
	US 20070152185	A1	20070705	US 2007-586601	20070104
PRAI	FR 2004-50156	A	20040128		
	WO 2005-FR50045	W	20050126		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
FR 2865576	ICM	H01M004-60
	ICS	H01M004-26
	IPCI	H01M0004-36 [I,C]; H01M0004-26 [I,C]; H01M0004-60 [I,A]; H01M0004-26 [I,A]
	IPCR	H01M0004-36 [I,C]; H01M0004-60 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-26 [I,C]; H01M0004-26 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
WO 2005076390	IPCR	C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
EP 1709702	IPCI	H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A];

		H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
JP 2007520038	IPCI	H01M0004-04 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [N,A]; H01M0010-36 [N,C*]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]; H01M0010-36 [N,C]; H01M0010-40 [N,A]
	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
	FTERM	5H029/AJ03; 5H029/AJ12; 5H029/AJ14; 5H029/AK03; 5H029/AL06; 5H029/AL07; 5H029/AL08; 5H029/CJ02; 5H029/CJ08; 5H029/CJ28; 5H029/DJ08; 5H029/EJ04; 5H029/EJ11; 5H029/EJ12; 5H029/HJ01; 5H029/HJ02; 5H029/HJ05; 5H029/HJ07; 5H029/HJ14; 5H050/AA08; 5H050/AA15; 5H050/AA19; 5H050/BA16; 5H050/BA17; 5H050/CA07; 5H050/CA08; 5H050/CA09; 5H050/CB07; 5H050/CB08; 5H050/CB09; 5H050/DA09; 5H050/EA08; 5H050/EA22; 5H050/EA23; 5H050/GA02; 5H050/GA10; 5H050/GA27; 5H050/HA01; 5H050/HA02; 5H050/HA05; 5H050/HA07; 5H050/HA14; 5H050/HA20
AT 380399	IPCI	H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
ES 2299019	IPCI	H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]
	IPCR	H01M0004-04 [I,C]; H01M0004-04 [I,A]; C01G0001-02 [I,C*]; C01G0001-02 [I,A]; C01G0001-06 [I,C*]; C01G0001-06 [I,A]; H01M0004-48 [I,C*]; H01M0004-48 [I,A]; H01M0004-50 [N,C*]; H01M0004-50 [N,A]; H01M0004-52 [N,C*]; H01M0004-52 [N,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]
	ECLA	C01G001/02; C01G001/06; H01M004/48B2; H01M004/62C2; M01P; T01M; T01M; T01M
US 20070152185	IPCI	H01B0001-06 [I,A]; H01B0001-18 [I,A]; H01B0001-14 [I,C*]
	NCL	252/182.100; 252/506.000; 252/507.000

AB Electrode-active materials, especially for alkali ion insertion (i.e., Na+ and Li+) for lithium batteries, contain, as an active component, a composition of general formula AaDdMmZsOoNnFf,, in which: (1) A is an alkali metal, (2) D is an alkaline earth metal or a Group IIIA element, with the exception of B, (3) M is a transition metal, (4) Z is a non-metal selected from S, Se, P, As, Si, Ge, Sn, and B, (5) O is oxygen, N is nitrogen, and F is fluorine, and (6) a, d, m, z, o, n, and f are ≥0. The compns., which also contain an electron conductor, such as carbon, are prepared by thermal decomposition of homogeneously mixed precursors, which are organic or organometallic derivs. (preferably at 200-600°). Preferred

components include: (1) A = Li, Na, and K, (2) D is Mg, Al, and Ga, (3) M = Fe, Ni, Co, Mn, V, Mo, Nb, W, and Ti; preferred components are LiFePO4, LiFeBO3, or NaFeBO3.

ST electrode mixed oxide lithium rechargeable battery; iron lithium borate secondary battery electrode

IT Transition metal oxides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(alkaline earth oxides, electrode active materials; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Transition metal oxides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(alkali metal oxides, electrode active materials; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Battery electrodes
(composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(dicarboxylic, metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(hydroxy, metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Amino acids, processes
Polyoxyalkylenes, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(oxo, metal salts and complexes, electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT Alkali metal oxides
Alkaline earth oxides
Group IIIA element oxides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(transition metal oxides, electrode active materials; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(elec. conductor; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)

IT 15365-14-7, Iron lithium phosphate (FeLiPO4) 332079-85-3, Iron lithium borate (FeLiBO3) 861001-97-0
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electrode active materials; composite mixed oxides as active

battery electrodes, especially for rechargeable lithium batteries)
IT 50-21-5D, Lactic acid, metal salts and complexes 56-40-6D, Aminoacetic acid, metal salts and complexes 56-41-7D, Alanine, metal salts and complexes 56-84-8D, L-Aspartic acid, metal salts and complexes 56-86-0D, L-Glutamic acid, metal salts and complexes 56-87-1D, L-Lysine, metal salts and complexes 61-90-5D, L-Leucine, metal salts and complexes 70-26-8D, Ornithine, metal salts and complexes 74-79-3D, L-Arginine, metal salts and complexes 77-92-9D, Citric acid, metal salts and complexes 79-14-1D, Glycolic acid, metal salts and complexes 87-69-4D, Tartaric acid, metal salts and complexes 90-64-2D, Mandelic acid, metal salts and complexes 107-21-1D, Ethylene glycol, metal salts and complexes 110-15-6D, Succinic acid, metal salts and complexes 110-16-7D, Maleic acid, metal salts and complexes 110-17-8D, Fumaric acid, metal salts and complexes 110-94-1D, Glutaric acid, metal salts and complexes 111-46-6D, Diethylene glycol, metal salts and complexes 123-76-2D, Levulinic acid, metal salts and complexes 124-04-9D, Adipic acid, metal salts and complexes 127-17-3D, Pyruvic acid, metal salts and complexes 141-82-2D, Malonic acid, metal salts and complexes 144-62-7D, Oxalic acid, metal salts and complexes 298-12-4D, Glyoxylic acid, metal salts and complexes 498-23-7D, Citraconic acid, metal salts and complexes 499-12-7D, Aconitic acid, metal salts and complexes 6915-15-7D, Malic acid, metal salts and complexes 28854-76-4D, metal salts and complexes 35054-79-6D, Hydroxybutyric acid, metal salts and complexes 111937-70-3D, Hydroxyacrylic acid, metal salts and complexes 151677-68-8
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(electrode precursors; thermal decomposition of; composite mixed oxides as active battery electrodes, especially for rechargeable lithium batteries)
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(4) Hydro Quebec; CA 2270771 A 2000 CAPLUS
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L81 ANSWER 16 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2005:667369 CAPLUS
DN 143:389692
ED Entered STN: 29 Jul 2005
TI Porous, carbon-decorated LiFePO4 prepared by sol-gel method based on citric acid
AU Gaberscek, Miran; Dominko, Robert; Bele, Marjan; Remskar, Maja; Hanzel, Darko; Jamnik, Janko
CS National Institute of Chemistry, Ljubljana, SI-1001, Slovenia
SO Solid State Ionics (2005), 176(19-22), 1801-1805
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier B.V.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB LiFePO4-C composite cathode material for lithium batteries was

prepared The active component consists of micrometer-sized particles having pores with a large size distribution. When filled with electrolyte, the pores are responsible for supply of ions while the distance between the pores (30-150 nm) dets. the solid-state diffusion kinetics. The walls of pores are covered with a C layer which serves as an electron conductor and is thin enough (2-3 nm) to allow penetration of Li ions. The synthesis is sol-gel based with a single heating step. The electrochem. performance is the best known for LiFePO4 cathodes.

ST porous iron lithium phosphate carbon composite cathode lithium battery

IT Secondary batteries
(lithium; porous carbon-LiFePO4 composite cathode material for lithium batteries)

IT Battery cathodes
Porous materials
(porous carbon-LiFePO4 composite cathode material for lithium batteries)

IT Sol-gel processing
(porous carbon-LiFePO4 composite cathode material prepared by sol-gel processing based on citric acid)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(porous carbon-LiFePO4 composite cathode material for lithium batteries)

IT 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(porous carbon-LiFePO4 composite cathode material for lithium batteries)

IT 77-92-9, Citric acid, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(porous carbon-LiFePO4 composite cathode material prepared by sol-gel processing based on citric acid)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 17 OF 21 CAPLUS

AN 2004:1028841 CAPLUS

DN 142:222476

ED Entered STN: 01 Dec 2004
TI Low temperature preparation of optimized phosphates for Li-battery applications
AU Delacourt, Charles; Wurm, Calin; Reale, Priscilla; Morcrette, Mathieu; Masquelier, Christian
CS Laboratoire de Reactivite et de Chimie des Solides, CNRS UMR 6007, Universite de Picardie Jules Verne, Amiens, 80039, Fr.
SO Solid State Ionics (2004), 173(1-4), 113-118
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier B.V.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 72
AB The authors describe the thermodn. and kinetics that govern the precipitation of pure powders of phosphates phases of interest for Li-battery applications. The authors found precise procedures for the formation of three distinct crystalline forms of FePO4·2H2O and of pure LiMnPO4. The attempts to precipitate either LiCoPO4 or LiFePO4, however, failed. In this latter case, optimized electrodes for battery applications were synthesized through a chemical conductive carbon coating at the surface of LiFePO4 prepared by evaporation of an FeIII-containing aqueous solution
ST temp optimized phosphate lithium battery electrode material pptn; pptn soly equil iron lithium phosphate manganese cobalt evapn; battery electrode lithiation phosphate capacitance potential carbonaceous coated
IT Electric conductors
(carbon; low temperature preparation of optimized phosphates for Li-battery applications)
IT Electric potential
(during galvanic cycling of lithium transition metal phosphates; low temperature preparation of optimized phosphates for Li-battery applications)
IT Electric capacitance
(galvanic cycling of lithium transition metal phosphates; low temperature preparation of optimized phosphates for Li-battery applications)
IT Precipitation (chemical)
(kinetics; low temperature preparation of optimized phosphates for Li-battery applications)
IT Lithiation
(lithium insertion; low temperature preparation of optimized phosphates for Li-battery applications)
IT Battery electrodes
Evaporation
(low temperature preparation of optimized phosphates for Li-battery applications)
IT Solubility
(thermodn. calcns. for phases and precipitation process; low temperature preparation of optimized phosphates for Li-battery applications)
IT 15365-14-7P, Iron lithium phosphate (FeLiPO4)
RL: SPN (Synthetic preparation); PREP (Preparation)
(carbonaceous material-coated; low temperature preparation of optimized phosphates for Li-battery applications)
IT 14567-75-0P, Metastrengite
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(crystal types I and II; low temperature preparation of optimized phosphates for Li-battery applications)

IT 14986-93-7, Manganese phosphate (MnPO4)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(delithiated form; low temperature preparation of optimized phosphates for Li-battery applications)
IT 13463-10-0P, Iron phosphate (FePO4) dihydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 7440-44-0, Carbon, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 77-92-9, Citric acid, uses 107-21-1, Ethylene glycol, uses 1310-73-2, Sodium hydroxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 13824-49-2P, Strengite
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 13826-59-0P, Lithium manganese phosphate (LiMnPO4)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 7664-38-2, Phosphoric acid, reactions 7705-08-0, Iron chloride, reactions 10421-48-4, Ferric nitrate 13453-80-0, Lithium dihydrogen phosphate
RL: RCT (Reactant); RACT (Reactant or reagent)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 36550-56-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(low temperature preparation of optimized phosphates for Li-battery applications)
IT 10377-52-3, Trilithium phosphate
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(phase formed during some pptns.; low temperature preparation of optimized phosphates for Li-battery applications)
IT 12672-51-4, Cobalt hydroxide 18933-05-6, Manganese hydroxide 51349-94-1, Manganese hydrogen phosphate
RL: PRP (Properties)
(solubility calcns. including; low temperature preparation of optimized phosphates for
Li-battery applications)
RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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L81 ANSWER 18 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2004:689393 CAPLUS
DN 141:352642
ED Entered STN: 24 Aug 2004
TI Synthesis and characterization of nano-sized LiFePO4 cathode materials prepared by a citric acid-based sol-gel route
AU Hsu, Kuei-Feng; Tsay, Sun-Yuan; Hwang, Bing-Joe
CS Department of Chemical Engineering, National Cheng Kung University, Tainan, 701, Taiwan
SO Journal of Materials Chemistry (2004), 14(17), 2690-2695
CODEN: JMACEP; ISSN: 0959-9428
PB Royal Society of Chemistry
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB LiFePO4/carbon composite cathode materials were synthesized by a sol-gel process. The citric acid in the developed sol-gel process plays the role not only as a complexing agent but also as a carbon source, which improves the conductivity of the composites and hinders the growth of LiFePO4 particles. Nanosized LiFePO4 particles without the impurity phase were successfully synthesized. The grain size of LiFePO4 particles in the range of 20-30 nm is obtained at calcining temps. 450-850°. Increasing the calcination temperature leads to a decrease in the carbon content but an increase in the conductivity of the composites in the range of 400-850°. However, the conductivity slightly decreases if the calcination temperature further increases to 950°. The LiFePO4/carbon composite synthesized at 850° shows the highest conductivity (10-3 S/cm), the highest sp. capacity, and the best rate capability among the synthesized materials. It is worthy to note that the cell performance of the LiFePO4 depends on the electrochem. cycling procedure employed.
ST iron lithium phosphate carbon composite cathode synthesis sol gel; citric acid iron lithium phosphate carbon composite cathode synthesis; battery iron lithium phosphate carbon composite cathode
IT Battery cathodes
(synthesis and characterization of nanosized iron lithium phosphate/carbon composite cathode materials prepared by citric acid-based sol-gel method)
IT 15365-14-7, Iron lithium phosphate (FeLiPO4)
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(composite with carbon; synthesis and characterization of nanosized iron lithium phosphate/carbon composite cathode materials prepared by citric acid-based sol-gel method)
IT 7440-44-0, Carbon, uses

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(composite with iron lithium phosphate; synthesis and characterization of nanosized iron lithium phosphate/carbon composite cathode materials prepared by citric acid-based sol-gel method)

IT 77-92-9, Citric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(synthesis and characterization of nanosized iron lithium phosphate/carbon composite cathode materials prepared by citric acid-based sol-gel method)

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 19 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN

AN 2004:3211 CAPLUS

DN 140:44760

ED Entered STN: 02 Jan 2004

TI Process for production of carbon-coated lithium-containing powders for lithium secondary battery

IN Audemer, Albane; Wurm, Calin; Morcrette, Mathieu; Gwizdala, Sylvain; Masquelier, Christian

PA Umicore, Belg.; Le Centre National de la Recherche Scientifique

SO PCT Int. Appl., 18 pp.
CODEN: PIXXD2

DT Patent

LA English

IC ICM H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004001881	A2	20031231	WO 2003-EP6628	20030619
	WO 2004001881	A3	20041229		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,

BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

CA	2490091	A1	20031231	CA 2003-2490091	20030619
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

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PRAI EP	2002-291562	A	20020621		
US	2002-392978P	P	20020702		
WO	2003-EP6628	W	20030619		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2004001881	ICM	H01M004-58
	IPCI	H01M0004-58 [ICM,7]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; C01B0025-30 [I,A]; C01B0025-37 [I,A]; C09C0003-10 [I,C*]; C09C0003-10 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]; H01M0006-18 [I,C*]; H01M0006-18 [I,A]; H01M0010-36 [I,C*]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
	ECLA	H01M004/58D; C01B025/37; C01B025/45; H01M004/36; H01M004/62; H01M004/62C2; H01M006/18D; H01M010/36S; T01M
CA 2490091	IPCI	H01M0004-58 [ICM,7]; C09C0003-10 [ICS,7]; C01B0025-30 [ICS,7]; C01B0025-00 [ICS,7,C*]; H01M0004-36 [ICS,7]; H01M0004-62 [ICS,7]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; C01B0025-30 [I,A]; C01B0025-37 [I,A]; C09C0003-10 [I,C*]; C09C0003-10 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]; H01M0006-18 [I,C*]; H01M0006-18 [I,A]; H01M0010-36 [I,C*]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
	ECLA	T01M
AU 2003250847	IPCI	H01M0004-58 [ICM,7]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; C01B0025-30 [I,A]; C01B0025-37 [I,A]; C09C0003-10 [I,C*]; C09C0003-10 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]; H01M0006-18 [I,C*]; H01M0006-18 [I,A]; H01M0010-36 [I,C*]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
	ECLA	T01M
EP 1518284	IPCI	H01M0004-58 [ICM,7]
	IPCR	H01M0004-58 [I,C*]; H01M0004-58 [I,A]
CN 1663064	IPCI	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-30 [I,A]; C01B0025-00 [I,C*]; C09C0003-10 [I,C]; C09C0003-10 [I,A]; H01M0004-36 [I,C]; H01M0004-36 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; C01B0025-30 [I,A]; C01B0025-37 [I,A]; C09C0003-10 [I,C*]; C09C0003-10 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62

		[I,C*]; H01M0004-62 [I,A]; H01M0006-18 [I,C*]; H01M0006-18 [I,A]; H01M0010-36 [I,C*]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
	ECLA	T01M; H01M004/58D; C01B025/37; C01B025/45; H01M004/36; H01M004/62; H01M004/62C2; H01M006/18D; H01M010/36S
JP 2005530676	IPCI	C01B0025-45 [ICM,7]; C01B0025-00 [ICM,7,C*]; H01M0004-02 [ICS,7]; H01M0004-58 [ICS,7]; H01M0010-40 [ICS,7]; H01M0010-36 [ICS,7,C*]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; C01B0025-30 [I,A]; C01B0025-37 [I,A]; C09C0003-10 [I,C*]; C09C0003-10 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-62 [I,C*]; H01M0004-62 [I,A]; H01M0006-18 [I,C*]; H01M0006-18 [I,A]; H01M0010-36 [I,C*]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
	ECLA	T01M
	FTERM	5H029/AJ02; 5H029/AJ05; 5H029/AK01; 5H029/AL12; 5H029/AM03; 5H029/AM05; 5H029/AM07; 5H029/CJ02; 5H029/CJ08; 5H029/CJ11; 5H029/CJ22; 5H029/CJ28; 5H029/DJ16; 5H029/EJ04; 5H029/HJ01; 5H029/HJ02; 5H029/HJ14; 5H050/AA02; 5H050/AA07; 5H050/BA17; 5H050/CA01; 5H050/CB12; 5H050/DA02; 5H050/DA09; 5H050/EA08; 5H050/FA17; 5H050/FA18; 5H050/GA02; 5H050/GA10; 5H050/GA11; 5H050/GA22; 5H050/GA27; 5H050/HA01; 5H050/HA02; 5H050/HA14
US 20060035150	IPCI	H01M0004-58 [I,A]; B05D0005-12 [I,A]
	IPCR	H01M0004-58 [I,A]; B05D0005-12 [I,C]; B05D0005-12 [I,A]; H01M0004-58 [I,C]
	NCL	429/221.000; 252/182.100; 427/122.000; 429/231.950
	ECLA	C01B025/45; C01B025/37; C01B025/37D; H01M004/02B; H01M004/58D; H01M004/62C2; H01M010/40L; T01M; T01M; T01M

AB The invention provides a new route for the synthesis of carbon-coated powders having the olivine or NASICON structure, which form promising classes of active products for the manufacture of rechargeable lithium batteries. Carbon-coating of the powder particles is necessary to achieve good performances because of the rather poor electronic conductivity of the structures. For the preparation of coated LiFePO4, sources of Li, Fe and phosphate are dissolved in an aqueous solution together with a polycarboxylic acid and a polyhydric alc. Upon water evaporation, polyesterification occurs while a mixed precipitate is formed containing Li, Fe and phosphate. The resin-encapsulated mixture is then heat treated at 700° in a reducing atmospheric This results in the production of a fine powder consisting of an olivine LiFePO4 phase, coated with conductive carbon. When this powder is used as active material in a lithium insertion-type electrode, fast charge and discharge rates are obtained at room temperature and an excellent capacity retention is observed

ST battery carbon coated lithium contg powder prepn

IT Olivine-group minerals
RL: DEV (Device component use); USES (Uses)
(lithium-containing; process for production of carbon-coated lithium-containing powders for lithium secondary battery)

IT Secondary batteries
(lithium; process for production of carbon-coated lithium-containing powders for lithium secondary battery)

IT Carboxylic acids, uses
RL: DEV (Device component use); USES (Uses)
(polycarboxylic; process for production of carbon-coated lithium-containing powders for lithium secondary battery)

IT Polymerization
(polyesterification; process for production of carbon-coated lithium-containing
powders for lithium secondary battery)
IT Alcohols, uses
RL: DEV (Device component use); USES (Uses)
(polyhydric; process for production of carbon-coated lithium-containing powders
for lithium secondary battery)
IT Battery cathodes
(process for production of carbon-coated lithium-containing powders for lithium
secondary battery)
IT 77641-62-4, Nasicon
RL: DEV (Device component use); USES (Uses)
(lithium-containing; process for production of carbon-coated lithium-containing
powders for lithium secondary battery)
IT 10421-48-4, Ferric nitrate 13453-80-0, Lithium dihydrogen phosphate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process);
PROC (Process)
(process for production of carbon-coated lithium-containing powders for lithium
secondary battery)
IT 77-92-9, Citric acid, uses 107-21-1, Ethylene glycol, uses
RL: DEV (Device component use); USES (Uses)
(process for production of carbon-coated lithium-containing powders for lithium
secondary battery)
IT 15365-14-7P, Iron lithium phosphate felipo4
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation);
USES (Uses)
(process for production of carbon-coated lithium-containing powders for lithium
secondary battery)
IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(process for production of carbon-coated lithium-containing powders for lithium
secondary battery)

L81 ANSWER 20 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN
AN 2003:92339 CAPLUS
DN 138:125008
ED Entered STN: 06 Feb 2003
TI Cathode materials for secondary lithium batteries
IN Armand, Michel; Goodenough, John B.; Padhi, Akshaya K.; Nanjundaswamy, Kirakodu S.; Masquelier, Christian
PA Board of Regents, the University of Texas System, USA
SO U.S., 21 pp., Cont.-in-part of U.S. 5,910,382.
CODEN: USXXAM
DT Patent
LA English
IC ICM H01M004-58
INCL 429231100; 429218100; 429224000; 429221000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6514640	B1	20030204	US 1997-998264	19971224
	US 5910382	A	19990608	US 1997-840523	19970421

	CA 2543784	A1	19971030	CA 1997-2543784	19970423
	EP 1501137	A2	20050126	EP 2004-22447	19970423
	EP 1501137	A3	20061025		
	R: DE, FR, GB, IT				
	EP 1755182	A1	20070221	EP 2006-20470	19970423
	R: DE, FR, GB, IT				
	EP 1755183	A1	20070221	EP 2006-21083	19970423
	R: DE, FR, GB, IT				
	US 6391493	B1	20020521	US 1999-298080	19990423
	US 20030082454	A1	20030501	US 2002-307346	20021202
	US 20050003274	A1	20050106	US 2004-902142	20040730
	US 20050244321	A1	20051103	US 2005-179617	20050713
	US 20070117019	A1	20070524	US 2006-647899	20061229
	US 20070166618	A1	20070719	US 2006-648316	20061229
	JP 2007214147	A	20070823	JP 2007-128682	20070514
	JP 2007294463	A	20071108	JP 2007-128681	20070514
	US 20070281215	A1	20071206	US 2007-890130	20070803
PRAI	US 1996-16060P	P	19960423		
	US 1996-32346P	P	19961204		
	US 1997-840523	A2	19970421		
	CA 1997-2251709	A3	19970423		
	EP 1997-923437	A3	19970423		
	EP 2004-22447	A3	19970423		
	JP 1997-538259	A3	19970423		
	US 1997-998264	A1	19971224		
	US 2002-307346	B1	20021202		
	US 2004-902142	A1	20040730		
	US 2005-179617	A1	20050713		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 6514640	ICM	H01M004-58
	INCL	429231100; 429218100; 429224000; 429221000
	IPCI	H01M0004-58 [ICM,7]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [N,C*]; H01M0004-02 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	NCL	429/231.100; 429/218.100; 429/221.000; 429/224.000
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
US 5910382	IPCI	H01M0004-58 [ICM,6]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [N,C*]; H01M0004-02 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	NCL	429/218.100; 429/221.000; 429/224.000
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
CA 2543784	IPCI	H01M0004-40 [I,A]; H01M0010-00 [I,A]
	IPCR	H01M0004-40 [I,A]; H01M0004-40 [I,C]; H01M0010-00 [I,C]; H01M0010-00 [I,A]
EP 1501137	IPCI	H01M0004-58 [I,A]; C01B0025-26 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	ECLA	H01M004/58D; C01B025/45; T01M; T01M
EP 1755182	IPCI	H01M0004-58 [I,A]; C01B0025-26 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
EP 1755183	IPCI	H01M0004-58 [I,A]; C01B0025-26 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
US 6391493	IPCI	H01M0004-58 [ICM,7]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [N,C*]; H01M0004-02 [N,A]; H01M0004-58 [I,C*];

		H01M0004-58 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	NCL	429/218.100; 429/231.100
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
US 20030082454	IPCI	H01M0004-58 [ICM,7]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [N,C*]; H01M0004-02 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	NCL	429/231.950; 429/221.000; 429/223.000; 429/224.000; 429/231.500
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
US 20050003274	IPCI	H01M0004-58 [ICM,7]; H01M0004-62 [ICS,7]; C01B0033-32 [ICS,7]; C01B0033-00 [ICS,7,C*]; C01B0025-26 [ICS,7]; C01B0025-00 [ICS,7,C*]; C01B0017-98 [ICS,7]; C01B0017-00 [ICS,7,C*]; C01G0031-02 [ICS,7]; C01G0031-00 [ICS,7,C*]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [N,C*]; H01M0004-02 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	NCL	429/231.950; 423/306.000; 423/332.000; 423/518.000; 423/594.800; 429/217.000; 429/220.000; 429/221.000; 429/223.000; 429/224.000; 429/229.000; 429/231.500
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
US 20050244321	IPCI	H01M0004-58 [ICM,7]; C01B0025-45 [ICS,7]; C01B0025-00 [ICS,7,C*]
	IPCR	C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	NCL	423/306.000; 252/182.100; 429/221.000; 429/223.000; 429/224.000; 429/231.500; 429/231.900; 429/231.950
	ECLA	H01M004/58D; C01B025/45; T01M
US 20070117019	IPCI	H01M0004-58 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]
	NCL	429/231.950; 423/306.000; 429/221.000; 429/223.000; 429/224.000; 429/231.500
	ECLA	C01B025/45
US 20070166618	IPCI	H01M0004-58 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]
	NCL	429/231.950; 423/306.000; 429/221.000; 429/223.000; 429/224.000
	ECLA	C01B025/45
JP 2007214147	IPCI	H01M0004-58 [I,A]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]
	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
	FTERM	5H050/AA02; 5H050/BA17; 5H050/CA01; 5H050/CB12; 5H050/GA02; 5H050/GA10; 5H050/GA12; 5H050/GA27; 5H050/GA28; 5H050/HA02; 5H050/HA14; 5H050/HA17; 5H050/HA18; 5H050/HA19
JP 2007294463	IPCI	H01M0004-58 [I,A]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0010-36 [N,C*]; H01M0010-40 [N,A]

	ECLA	C01B025/45; H01M004/58D; T01M; T01M; T01M; T01M
	FTERM	5H050/AA01; 5H050/AA02; 5H050/AA17; 5H050/BA16; 5H050/BA17; 5H050/CA01; 5H050/CB12; 5H050/FA17; 5H050/HA02; 5H050/HA05; 5H050/HA18
US 20070281215	IPCI	H01M0004-58 [I,A]; C01B0025-45 [I,A]; C01B0025-00 [I,C*]
	IPCR	H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]
	NCL	429/231.950; 423/306.000; 429/221.000; 429/223.000; 429/224.000; 429/231.500
	ECLA	C01B025/45

AB The invention relates to materials for use as electrodes in an alkali-ion secondary battery, particularly a lithium-ion battery. The invention provides transition-metal compds. having the ordered-olivine, a modified olivine, or the rhombohedral NASICON structure and the polyanion (PO4)3- as at least one constituent for use as electrode material for alkali-ion rechargeable batteries.

ST cathode lithium secondary battery

IT Transition metal nitrides
RL: DEV (Device component use); USES (Uses)
(Li-containing; cathode materials for secondary lithium batteries)

IT EPDM rubber
Fluoropolymers, uses
Polyesters, uses
Polyethers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(binder; cathode materials for secondary lithium batteries)

IT Battery anodes
Battery cathodes
(cathode materials for secondary lithium batteries)

IT Chalcogenides
RL: DEV (Device component use); USES (Uses)
(lamellar; cathode materials for secondary lithium batteries)

IT Secondary batteries
(lithium; cathode materials for secondary lithium batteries)

IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(cathode materials for secondary lithium batteries)

IT 116-14-3D, Tetrafluoroethylene, copolymer 9002-84-0, Ptfe 9011-14-7, Pmma 24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile
RL: MOA (Modifier or additive use); USES (Uses)
(binder; cathode materials for secondary lithium batteries)

IT 69104-84-3, Sodium vanadiumphosphate Na3V2(PO4)3
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(cathode materials for secondary lithium batteries)

IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-21-1D, Ethylene glycol, dialkyl ether 108-32-7, Propylene carbonate 111-46-6D, DiEthylene glycol, dialkyl ether 112-27-6D, TriEthylene glycol, dialkyl ether 112-60-7D, TetraEthylene glycol, dialkyl ether 616-38-6, Dimethyl carbonate 623-53-0, Methyl ethyl carbonate 7439-93-2, Lithium, uses 7803-58-9D, Sulfamide, tetraalkyl derivative 36058-25-0, Iron lithium phosphate Fe2Li3(PO4)3 39302-37-9, Lithium titanium oxide 39448-96-9, Graphite-lithium 77641-62-4, Nasicon 223505-09-7, Iron lithium titanium phosphate 277742-93-5, Vanadium oxide VO2.1-2.5
RL: DEV (Device component use); USES (Uses)
(cathode materials for secondary lithium batteries)

IT 13824-63-0P, Cobalt lithium phosphate colipo4 13826-59-0P, Lithium manganese phosphate limnpo4 13977-83-8P, Lithium nickel phosphate linipo4 15365-14-7P, Iron lithium phosphate felipo4

37144-98-2P, Niobium titanium phosphate NbTi(PO4)3 161774-31-8P, Iron lithium niobium phosphate FeLiNb(PO4)3 184241-62-1P 205380-60-5P, Iron lithium phosphate sulfate Fe2Li(PO4)(SO4)2 488829-05-6P, Iron lithium manganese phosphate (Fe0.5-1LiMn0-0.5(PO4)) 488829-06-7P, Iron lithium titanium phosphate silicate (Fe0.8Li1.1Ti(PO4)0.8(SiO4)0.2) 951777-58-5P, Lithium sodium vanadium phosphate Li2NaV2(PO4)3
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(cathode materials for secondary lithium batteries)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cathode materials for secondary lithium batteries)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Anon; JP 09-134725 1997 CAPLUS
(2) Anon; JP 11-025983 1999 CAPLUS
(3) Anon; Spectrochim Acta, Part A 1974, V30A(3), P673 CAPLUS
(4) Delmas; Mater Res Bull 1988, V23, P65 CAPLUS
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(6) Padhi; J Electrochem Soc 1997, V144(4), P1188 CAPLUS
(7) Padhi, A; Journal Of Solid State Chemistry 1997, V128, P267 CAPLUS
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L81 ANSWER 21 OF 21 CAPLUS COPYRIGHT 2008 ACS on STN

AN 2001:796403 CAPLUS

DN 135:346864

ED Entered STN: 02 Nov 2001

TI Cathode for nonaqueous electrolyte lithium ion battery

IN Yamada, Atsuo; Yamahira, Takayuki

PA Sony Corporation, Japan

SO Eur. Pat. Appl., 26 pp.
CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-58
ICS C01G049-00; C01B025-30; C01B025-45; H01M004-38

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1150368	A2	20011031	EP 2001-109919	20010424
	EP 1150368	A3	20051026		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001307730	A	20011102	JP 2000-128998	20000425
	JP 3959929	B2	20070815		
	MX 2001PA04029	A	20030820	MX 2001-PA4029	20010423
	TW 533617	B	20030521	TW 2001-90109790	20010424
	CA 2344981	A1	20011025	CA 2001-2344981	20010425
	CN 1320976	A	20011107	CN 2001-117211	20010425
	US 20020004169	A1	20020110	US 2001-842485	20010425
	US 6746799	B2	20040608		
PRAI	JP 2000-128998	A	20000425		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1150368	ICM	H01M004-58
	ICS	C01G049-00; C01B025-30; C01B025-45; H01M004-38
	IPCI	H01M0004-58 [ICM,6]; C01G0049-00 [ICS,6]; C01B0025-30 [ICS,6]; C01B0025-45 [ICS,6]; C01B0025-00 [ICS,6,C*]; H01M0004-38 [ICS,6]

	IPCR	H01M0010-36 [I,C*]; H01M0010-40 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-38 [I,C*]; H01M0004-38 [I,A]; H01M0004-40 [N,C*]; H01M0004-40 [N,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A]; H01M0004-52 [I,C*]; H01M0004-52 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,A]
	ECLA	H01M004/525; C01B025/45; H01M004/131; H01M004/38; H01M004/58D; T01M; T01M; T01M; T01M
JP 2001307730	IPCI	H01M0004-58 [I,A]; H01M0004-02 [I,A]; H01M0010-40 [I,A]; H01M0010-36 [I,C*]
	IPCR	H01M0010-36 [I,C*]; H01M0010-40 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-38 [I,C*]; H01M0004-38 [I,A]; H01M0004-40 [N,C*]; H01M0004-40 [N,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A]; H01M0004-52 [I,C*]; H01M0004-52 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,A]
MX 2001PA04029	IPCI	H01M0004-50 [ICM,7]; H01M0004-58 [ICS,7]
TW 533617	IPCI	H01M0004-64 [ICM,7]
	IPCR	H01M0010-36 [I,C*]; H01M0010-40 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-38 [I,C*]; H01M0004-38 [I,A]; H01M0004-40 [N,C*]; H01M0004-40 [N,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A]; H01M0004-52 [I,C*]; H01M0004-52 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,A]
CA 2344981	IPCI	H01M0004-36 [ICM,7]; H01M0004-24 [ICS,7]; H01M0010-24 [ICS,7]
	IPCR	H01M0010-36 [I,C*]; H01M0010-40 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-38 [I,C*]; H01M0004-38 [I,A]; H01M0004-40 [N,C*]; H01M0004-40 [N,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A]; H01M0004-52 [I,C*]; H01M0004-52 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,A]
CN 1320976	IPCI	H01M0004-48 [ICM]; H01M0010-36 [ICS]
	IPCR	H01M0010-36 [I,C*]; H01M0010-40 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-38 [I,C*]; H01M0004-38 [I,A]; H01M0004-40 [N,C*]; H01M0004-40 [N,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A]; H01M0004-52 [I,C*]; H01M0004-52 [I,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [N,A]
US 20020004169	IPCI	H01M0004-58 [ICM,7]
	IPCR	H01M0010-36 [I,C*]; H01M0010-40 [I,A]; C01B0025-00 [I,C*]; C01B0025-45 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-36 [I,C*]; H01M0004-36 [I,A]; H01M0004-40 [N,C*]; H01M0004-40 [N,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A]; H01M0004-58 [I,C*]; H01M0004-58 [I,A]; H01M0004-38 [I,C*]; H01M0004-38 [I,A]; H01M0004-52 [I,C*]; H01M0004-52 [I,A]; H01M0010-36 [N,A]
	NCL	429/221.000; 429/224.000; 429/231.100; 429/231.800; 429/218.100
	ECLA	H01M004/525; C01B025/45; H01M004/131; H01M004/38; H01M004/58D; T01M; T01M; T01M; T01M

AB The lithium ion cell is improved appreciably in operational stability under special conditions, such as high temps., and exhibits superior characteristics against over-discharging, while guaranteeing compatibility to the operating voltage of a conventional lithium ion cell and an energy d. equivalent to that of the conventional lithium ion cell. To this end, the lithium ion cell includes a pos. electrode, a neg. electrode and a nonaq. electrolyte, and uses, as a pos. electrode active material, a composite material of a first lithium compound represented by the general formula LixMyPO4, where 0 <x< 2, 0.8 <y< 1.2 and M contains Fe, and a second lithium compound having a potential holder than the potential of the first lithium compound

ST lithium nonaq electrolyte cathode

IT Charcoal
RL: DEV (Device component use); USES (Uses)
(activated; cathode for nonaq. electrolyte lithium ion battery)

IT Battery cathodes
(cathode for nonaq. electrolyte lithium ion battery)

IT Carbon fibers, uses
Carbonaceous materials (technological products)
Coke
Petroleum coke
RL: DEV (Device component use); USES (Uses)
(cathode for nonaq. electrolyte lithium ion battery)

IT Carbon black, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cathode for nonaq. electrolyte lithium ion battery)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode for nonaq. electrolyte lithium ion battery)

IT Organic compounds, uses
RL: DEV (Device component use); USES (Uses)
(high mol., sintered; cathode for nonaq. electrolyte lithium ion battery)

IT Secondary batteries
(lithium; cathode for nonaq. electrolyte lithium ion battery)

IT Coke
RL: DEV (Device component use); USES (Uses)
(needle; cathode for nonaq. electrolyte lithium ion battery)

IT Coke
RL: DEV (Device component use); USES (Uses)
(pitch; cathode for nonaq. electrolyte lithium ion battery)

IT Furan resins
Phenolic resins, uses
RL: DEV (Device component use); USES (Uses)
(sintered and carbonized; cathode for nonaq. electrolyte lithium ion battery)

IT 50-21-5D, Lactic acid, ester 60-29-7, Diethyl ether, uses
64-19-7D, Acetic acid, ester, uses 75-05-8, Acetonitrile, uses
79-09-4D, Propionic acid, ester 96-47-9, 2-Methyltetrahydrofuran
96-48-0 96-49-1, Ethylene carbonate 100-66-3, Anisole, uses
105-58-8, Diethyl carbonate 107-12-0, Propionitrile 108-32-7,
Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane
126-33-0, Sulfolane 409-21-2, Silicon carbide sic, uses 554-12-1,
Methyl propionate 616-38-6, Dimethyl carbonate 623-42-7, Methyl
butyrate 623-96-1, Dipropyl carbonate 629-14-1, 1,2-Diethoxyethane
646-06-0, 1,3-Dioxolane 872-36-6, Vinylene carbonate 1072-47-5,
4-Methyl-1,3-dioxolane 1313-08-2 2550-62-1, Lithium methanesulfonate
4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7440-50-8,
Copper, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium
bromide 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate
9003-07-0, Polypropylene 12007-81-7, Silicon tetraboride 12008-29-6,

Silicon hexaboride 12013-56-8, Calcium disilicide 12017-12-8, Cobalt disilicide 12018-09-6, Chromium disilicide 12022-99-0, Iron disilicide 12032-86-9, Manganese disilicide 12033-76-0, Silicon nitride oxide Si2N2O 12033-89-5, Silicon nitride, uses 12034-80-9, Niobium disilicide 12039-79-1, Tantalum disilicide 12039-83-7, Titanium silicide TiSi2 12039-87-1, Vanadium disilicide 12039-88-2, Tungsten disilicide 12059-14-2, Nickel silicide (Ni2Si) 12136-78-6, Molybdenum disilicide 12159-07-8, Copper silicide cu5si 12190-79-3, Cobalt lithium oxide colio2 12201-89-7, Nickel disilicide 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15365-14-7, Iron lithium phosphate FeLiPO4 19414-36-9, Iron lithium manganese phosphate ((Fe,Mn)Li(PO4)) 21324-40-3, Lithium hexafluorophosphate 22831-39-6, Magnesium silicide (Mg2Si) 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 35678-71-8, Methylsulfolane 90076-65-6 113066-89-0, Cobalt lithium nickel oxide Co0.2LiNi0.8O2 113671-38-8, Silicon oxide SiO0-2 160479-36-7, Lithium tin oxide 178958-56-0, Lithium silicon oxide 300858-61-1 339333-78-7, Zinc silicide ZnSi2 371148-86-6, Tin oxide (SnO0-2) 371148-87-7, Lithium magnesium manganese oxide (LiMg0.2Mn0.8O2)
RL: DEV (Device component use); USES (Uses)
(cathode for nonaq. electrolyte lithium ion battery)

IT 24937-79-9, Pvdf
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode for nonaq. electrolyte lithium ion battery)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(pyrocarbon; cathode for nonaq. electrolyte lithium ion battery)

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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	85.51	203.57

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-16.80	-17.60

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